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CATALOGUE

OF THE

FISHES

IN THE

BRITISH MUSEUM.

BY

ALBERT GÜNTHER, M.A., M.D., Ph.D., F.Z.S.,

ETC. ETC.

VOLUME FIRST.

LONDON:
PRINTED BY ORDER OF THE TRUSTEES.
1859.

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CATALOGUE

OF THE

ACANTHOPTERYGIAN FISHES

IN THE

COLLECTION

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BRITISH MUSEUM.

BY

DR. ALBERT GÜNTHER.

VOLUME FIRST.

GASTEROSTEIDÆ, BERYCIDÆ, PERCIDÆ, APHREDODERIDÆ,
PRISTIPOMATIDÆ, MULLIDÆ, SPARIDÆ.

LONDON:
PRINTED BY ORDER OF THE TRUSTEES.
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PRINTED BY TAYLOR AND FRANCIS,
RED LION COURT, FLEET STREET.

PREFACE.

This Catalogue contains a description of all the species of Fish in the Collection of the British Museum, and of the species which are known to exist in other Museums, but which are desiderata in the National Collection, and therefore most desirable to be procured.

Most of the new and more interesting species have been figured. Descriptions of the skeleton of many of the specimens have been added.

Dr. Günther gives the following observations as to the method followed in its formation :—" This volume of the Catalogue contains the greater portion of Cuvier's *Percoides, Sciænoides, Sparoides*, and *Mænides*, with many other genera which, I believe, ought to be associated with them. There is no ichthyologist of the present day, who, looking at the great number of new forms discovered since Cuvier's period, would not think it advisable to subdivide some of the families adopted in the 'Règne Animal,' and subsequently in the 'Histoire Naturelle des Poissons' (as indeed was suggested by Cuvier himself), and to employ a part only of the characters assigned by him to the different families. Further, when genera and even species are known, in which the absence or presence of vomerine teeth is not constant, this character can no longer stand as distinctive of two large families like Cuvier's *Percoides* and *Sciænoides*. The same is the case with the character of a smooth or serrated præopercular edge. Instead of those characters has been substituted that of the relative development of the dorsal and anal fins. Thus, several portions of the *Percoides* of Cuvier have been separated, and form, together with some of his *Sciænoides* and *Sparoides*, and with the *Mænides*, families of themselves.

" This Catalogue comprises all the species, descriptions of which have been published in works accessible to me. The number of known species having been considerably increased in the last thirty years, and the descriptions of the new species being scattered through a great many Journals, Voyages, and Reports, such a general synopsis as is offered in the present Catalogue will meet a real want in Ichthyology. In confirmation of this, we need only compare the result of this volume with the number of species contained in the corresponding parts of the 'Histoire Naturelle des Poissons' by Cuvier and Valenciennes, the last general ichthyological work. There we find 777 species, 92 of which are described twice or thrice under different names*; 154 of the remaining 685 species are very doubtful, generally from insufficient description, and mostly established by Cuvier himself. The present Catalogue contains 1177 species, 917 of which are considered as properly distinguished, the remainder being merely enumerated. Thus we have—

Total number of species in Cuv. & Val.	777
Total number of species in this Catalogue	1177
Species apparently well characterized in Cuv. & Val.	531
Species apparently well characterized in this Catalogue	917

"The Collection of the British Museum, together with its Library, have enabled me to introduce original diagnoses of most of the species, and to compile the synonymy and revise that stated by Cuvier, thus raising this work above the point of a mere compilation. The Collection contains many typical specimens, as there have been embodied into it, besides other minor collections,—

"1. The Collection of Gronov, purchased with his MS. descriptions.

"2. Fishes of India, collected by General Hardwicke.

"3. The entire Collection of British Fishes, by Mr. William Yarrell.

"4. The Collection of the Fishes of the Frith of Forth, and Scottish Rivers, by Dr. Parnell.

"5. The Collection of Chinese Fishes, made by Mr. John Reeve and his son John Russell Reeve, described by Sir John Richardson, and the drawings of them taken from living or fresh specimens.

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* "Cuvier .... was ongelukkig in het scheppen van nieuwe soortbepalingen. Zijn groot ichthyologisch werk is vol van dubbele of meer voudige beschrijvingen eener zelfde soort, die naar verschillen van zeer ondergeschikte waarde, afhankelijk van geslacht, leeftijd en klimaat, als zoovele verschillende species plaats namen."—*Bleeker, Natuurk. Tijdschr. Nederl. Ind.* i. 1851, p. 344.

"6. The Collection of the Royal Naval Hospital of Haslar.

7. The Collection of Fishes of the Red Sea, described by, and procured from Dr. Rüppell.

"8. The Collection of Fishes of Japan, described by Prof. Schlegel, and received from the Leyden Museum.

"9. The Collection of Fishes of Amboyna, described by Dr. Bleeker, and presented by him to a charitable institution in Holland.

"10. Fishes from the Cape, presented by Sir Andrew Smith, M.D.

"11. The Collection of Freshwater Fishes of India, collected by Dr. Griffith, described by Dr. Macclelland, and presented by the Hon. East India Company (mostly Cyprinoids).

"12. The Fishes of the Seas of Madeira and the Canary Islands, described and presented by the Rev. R. T. Lowe.

"13. A Collection of the skulls and skeletons of German Fishes, made by Dr. A. Günther.

"By the kindness of the late Dr. Horsfield, the types of the species of Indian Fishes described by Dr. Cantor have been examined at the Museum of the Hon. East India Company.

"Wherever I have not had an opportunity of examining the species, and have been obliged to borrow the characters for a diagnosis from another description, I have added the authority. There remain, however, species which are either insufficiently described, or founded on characters so slight that it is doubtful whether they will stand as species,—or which are established from figures not executed by, or under the inspection of, naturalists: these are mentioned in notes, without a description, and with the synonymy only. Whoever has gone through the labour of examining such descriptions, of making the best of them, and of determining fishes by them, will know the amount of time fruitlessly spent, and will understand how to appreciate the more recent accounts of Bleeker, which combine with the distinctness of a diagnosis the accuracy of a description.

"To conclude, I add some explanatory remarks on my way of taking the measurements of specimens, of counting the scales, &c.:—

"1. The *height of the body* is always its greatest depth.

"2. The *length of the head* is the distance between the end of the snout and the posterior extremity of the *bony* operculum. The *length of the snout* is the distance between the end of the snout and the vertical from the anterior margin of the eye.

"3. The *total length* is the distance between the end of the snout and the extremity of the caudal fin, *when stretched out.*

"4. The *last dorsal* and *anal ray* is, generally, bifid to the base: it is counted as one, because only one interneural and interhæmal spine corresponds to it.

"5. *L. lat.* gives the number of pierced scales constituting the lateral line from the humeral arch to the root of the caudal fin, *i. e.* the number of transverse series of scales covering the body between the points mentioned. The scales of the lateral line are often smaller or larger, or irregular, and not congruent with the transverse series; in these cases I have counted the transverse series.

"6. *L. transv.* gives the number of scales in a series, which runs from the origin of the dorsal fin obliquely downwards to the median line of the abdomen, crossing the lateral line. It indicates the number of longitudinal series of scales between the origin of the dorsal fin and the lateral line, and between this and the abdomen. Sometimes the transverse line has such an oblique direction that the number of its scales would be greater than that of the longitudinal series: in this case I count the latter.—*The numbers of the lateral and transverse lines are of specific value.*

"7. The statement of the *size of the eye,* relative to the length of the head and its parts, is to be applied cautiously, this organ being comparatively much larger in young specimens than in mature ones. Statements taken from mature specimens of different species, of course have every right to be received into the diagnosis.

"8. In the descriptions of the *skeleton* the terminology given by Prof. Owen has been used.

"9. In the statement of the length of the vertebral column, the centrum only of the last caudal vertebra is included.

"The Plates referred to, and executed by Mr. Ford, will be published as a separate volume."

JOHN EDWARD GRAY.

British Museum,
May 5, 1859.

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——. Visschen van Borneo.

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——. (Banda, i.) Bydrage tot de kennis der ichthyologische fauna van de Banda-eilanden.

—— Visschen van Solor.

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* To shorten the numerous quotations in the text, many of the papers are marked with the name of the locality only, the ichthyological fauna of which has been described by Dr. Bleeker, as indicated by the names in parentheses.

1851. *Bleeker, P.* (Makreel.) Over eenige nieuwe geslachten en soorten van Makreelachtige visschen.

——. (Pleuronect.) Over eenige nieuwe soorten van Pleuronecteoïden.

——. Over eenige nieuwe soorten van Megalops, Dussumieria, Notopterus en Astronesthes.

——. Visschen van Billiton.

——. (Borneo, v.) Vijfde bydrage tot de kennis der ichthyologische fauna van Borneo.

—— (Riouw.) Bydrage tot de kennis der ichthyologische fauna van Riouw.

1852. ——. (Singapore.) Bydrage tot de kennis der ichthyologische fauna van Singapore.

——. (Blitong.) Bydrage tot de kennis der ichthyologische fauna van Blitong (Billiton).

——. (Timor, i.) Bydrage tot de kennis der ichthyologische fauna van Timor.

——. (Amb. and Cer.) Bydrage tot de kennis der ichthyologische fauna van de Moluksche eilanden. Visschen van Amboina en Ceram.

——. (Borneo, vi.) Zesde bydrage tot de kennis der ichthyologische fauna van Borneo.

——. (Banka.) Bydrage tot de kennis der ichthyologische fauna van het eiland Banka.

——. (Amboina, ii.) Nieuwe bydrage tot de kennis der ichthyologische fauna van Amboina.

——. (Sumatra, i.) Diagnostische beschryvingen van nieuwe of weinig bekende vischsoorten van Sumatra.

——. Nieuwe visschen van Banda Neira.

——. (Ceram, ii.) Nieuwe bydrage tot de kennis der ichthyologische fauna van Ceram.

——. (Banka, ii.) Nieuwe bydrage tot de kennis der ichthyologische fauna van het eiland Banka.

——. (Celebes, iii.) Derde bydrage tot de kennis der ichthyologische fauna van Celebes.

——. Index specierum Piscium Malayo-Moluccensium in voluminibus i., ii. et iii. Diarii Societatis Scientiarum Indo-Batavæ descriptarum, adjectis locis habitationis.

1853. ——. (Amboina, iii.) Derde bydrage tot de kennis der ichthyologische fauna van Amboyna.

——. (Ternate.) Bydrage tot de kennis der ichthyologische fauna van Ternate.

——. Over eenige nieuwe soorten van Homaloptera.

——. Exocœtus hexazona, eene nieuwe soort van Banka.

——. (Sumatra, ii.) Diagnostische beschryvingen van nieuwe of weinig bekende vischsoorten van Sumatra.

——. Sycidium parvei, Bleeker.

——. (Batavia.) Diagnostische beschryvingen van nieuwe of weinig bekende vischsoorten van Batavia.

——. (Ternate, ii.) Nieuwe bydrage tot de kennis der ichthyologische fauna van Ternate en Halmaheira (Gilolo).

1853. *Bleeker, P.* Index specierum Piscium Malayo-Moluccensium in volumine iv. Diarii Soc. Scient. Indo-Batavæ descriptarum, adjectis locis habitationis.

——. (Solor.) Bydrage tot de kennis der ichthyologische fauna van Solor.

——. (Celebes, iv.) Vierde bydrage tot de kennis der ichthyologische fauna van Celebes.

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——. (Ceram, iii.) Derde bydrage tot de kennis der ichthyologische fauna van Ceram.

——. (Amboina, iv.) Vierde bydrage tot de kennis der ichthyologische fauna van Amboina.

——. (Borneo, vii.) Zevende bydrage tot de kennis der ichthyologische fauna van Borneo.

——. (Sumatra, iii.) Nieuwe tientallen diagnostische beschryvingen van nieuwe of weinig bekende vischsoorten van Sumatra.

——. Antennarius notophthalmus.

——. Index specierum Piscium Malayo-Moluccensium in vol. v. Diarii Soc. Scient. Indo-Batavæ descriptarum, adjectis locis habitationis.

——. (Gilolo.) Bydrage tot de kennis der ichthyologische fauna van Halmaheira (Gilolo).

(Banda, iii.) Derde bydrage tot de kennis der ichthyologische fauna van de Banda-eilanden.

——. Diagramma hæmatochir.

1854. ——. Species Piscium Bataviensium novæ vel minus cognitæ.

——. (Timor, ii.) Nieuwe bydrage tot de kennis der ichthyologische fauna van Timor.

——. (Floris.) Bydrage tot de kennis der ichthyologische fauna van het eiland Floris.

——. Syngnathus tapeïnosoma.

——. Diagramma polytænioides.

——. (Japan.) Faunæ Ichthyologicæ Japonicæ species novæ.

——. (Amboina, v.) Vyfde bydrage tot de kennis der ichthyologische fauna van Amboina.

——. Eleotris tolsoni.

——. Index specierum Piscium Malayo-Moluccensium et Japonensium in vol. vi. Diarii Soc. Scient. Indo-Batavæ descriptarum, adjectis locis habitationis.

1854. vii. ——. (Kokos.) Bydrage tot de kennis der ichthyologische fauna van de Kokos-eilanden.

——. (Sumatra, iv.) Overzigt der ichthyologische fauna van Sumatra met beschryving van eenige nieuwe soorten.

——. Iets over Visschen levende in Zeesteeren, en over eene nieuwe soort van Oxybeles.

——. (Celebes, v.) Vyfde bydrage tot de kennis der ichthyologische fauna van Celebes.

——. Ichthyologische waarnemingen, gedaan op verschillende reizen in de residentie Banten.

—— Over eenige nieuwe visschen van de Kokos-eilanden.

1854. vii. *Bleeker, P.* (Batjan.) Bydrage tot de kennis der ichthyologische fauna van Batjan.

——. (Java, ii.) Specierum Piscium Javanensium novarum vel minus cognitarum diagnoses adumbratæ.

——. (Celebes, vi.) Zesde bydrage tot de kennis der ichthyologische fauna van Celebes.

——. Dactylopterus cheirophthalmus.

——. Nog iets over Visschen levende in Echinodermen.

——. Index specierum Piscium Malayo-Moluccensium in vol. vii. Diarii Soc. Scient. Indo-Batavæ descriptarum, adjectis locis habitationis.

1855. viii. ——. (Borneo, viii.) Achtste bydrage tot de kennis der ichthyologische fauna van Borneo.

——. (Kokos, iii.) Derde bydrage tot de kennis der ichthyologische fauna van de Kokos-eilanden.

——. Antennarius lindgreeni.

——. (Ternate, v.) Vyfde bydrage tot de kennis der ichthyologische fauna van Ternate.

——. (Batoe.) Bydrage tot de kennis der ichthyologische fauna van de Batoe-eilanden.

——. (Amboina, vi.) Zesde bydrage tot de kennis der ichthyologische fauna van Amboina.

——. (Celebes, vii.) Zevende bydrage tot de kennis der ichthyologische fauna van Celebes.

——. (Kokos, iv.) Vierde bydrage tot de kennis der ichthyologische fauna van de Kokos-eilanden.

——. Index specierum Piscium Malayo-Moluccensium in vol. viii. Diarii Soc. Scient. Indo-Batavæ descriptarum, adjectis locis habitationis.

ix. ——. (Batoe, ii.) Tweede bydrage tot de kennis der ichthyologische fauna van de Batoe-eilanden.

——. (Gilolo, ii.) Nieuwe bydrage tot de kennis der ichthyologische fauna van Halmaheira (Gilolo).

——. Nieuwe bydrage tot de kennis der ichthyologische fauna van Sumbawa.

——. (Batjan, ii.) Tweede bydrage tot de kennis der ichthyologische fauna van Batjan.

——. Nalezingen op de Vischfauna van Sumatra.

——. (Celebes, viii.) Achtste bydrage tot de kennis der ichthyologische fauna van Celebes.

——. (Java, iii.) Verslag van eenige verzamelingen van Visschen van Oost-Java.

——. (Borneo, ix.) Negende bydrage tot de kennis der ichthyologische fauna van Borneo.

——. Bydrage tot de kennis der ichthyologische fauna van het eiland Groot-Oby.

——. (Batjan, iii.) Derde bydrage tot de kennis der ichthyologische fauna van Batjan.

——. Index specierum Piscium Malayo-Moluccensium in vol. ix Diarii Soc. Scient. Indo-Batavæ descriptarum, adjectis locis habitationis.

1856. x. *Bleeker, P.* Tweede bydrage tot de kennis der ichthyologische fauna van het eiland Bintang.

——. (Ternate, vii.) Zevende bydrage tot de kennis der ichthyologische fauna van Ternate.

——. Carcharias amblyrhynchos.

——. Index specierum Piscium in voluminibus i.–x. Diarii Soc Scient. Indo-Batavæ descriptarum.

xi. ——. Verslag omtrent eenige vischsoorten gevangen aan de zuidkust van Malang in Oost-Java.

——. (Banda, v.) Vyfde bydrage tot de kennis der ichthyologische fauna van de Banda-eilanden.

——. (Boeroe.) Bydrage tot de kennis der ichthyologische fauna van het eiland Boeroe.

——. Verslag van eenige verzamelingen van zee- en zoetwatervisschen van het eiland Banka.

xii. ——. (Ternate, viii.) Achtste bydrage tot de kennis der ichthyologische fauna van Ternate.

——. (Nias.) Bydrage tot de kennis der ichthyologische fauna van het eiland Nias.

——. (Batoe, iii.) Derde bydrage tot de kennis der ichthyologische fauna van de Batoe-eilanden.

——. Nieuwe bydrage tot de kennis der ichthyologische fauna van Bali.

——. Index specierum Piscium in vol. xi. et xii. Diarii Soc. Scient. Indo-Batavæ descriptarum.

——. (Java, iv.) Descriptiones specierum Piscium Javanensium novarum vel minus cognitarum diagnosticæ.

——. (Sangi.) Bydrage tot de kennis der ichthyologische fauna van Sangi-eilanden.

——. Verslag omtrent eenige vischsoorten van Timor-koepang en Timor-delhi.

1857. xiii. ——. (Boeroe, ii.) Tweede bydrage tot de kennis der ichthyologische fauna van Boeroe.

1858. xv. ——. (Java, v.) Visschen van Java's zuidkust.

——. Holacanthus pseudannularis van Batavia.

——. (Goram.) Bydrage tot de kennis der Vischfauna van den Goram-archipel.

——. (Billiton, iv.) Vierde bydrage tot de kennis der Vischfauna van Billiton.

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1849. ——. Overzigt der te Batavia voorkomende Gladschubbige Labroiden in Verhand. Bat. Genootsch. xxii.

——. (Perc.) Bydrage tot de kennis der Percoiden van den Malayo-Molukschen Archipel. *Ibid.*

——. Bydrage tot de kennis der Scleroparei van den Soenda-Molukschen Archipel. *Ibid.*

——. Bydrage tot de kennis der Blennioiden en Gobioiden van den Soenda-Molukschen Archipel. *Ibid.*

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1849. *Bleeker, P.* Bydrage tot de kennis der ichthyologische fauna van het eiland Madura. *Ibid.*

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——. Bydrage tot de kennis der Mænoiden van den M. Archipel. *Ibid.*

——. Bydrage tot de kennis der Visschen met doolhofvormige kieuwen (Labyrinthici) van den S.-M. Archipel. *Ibid.*

——. Bydrage tot de kennis der Chætodontoïden van den S.-M. Archipel. *Ibid.*

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——. Bydrage tot de kennis der Haringachtige Visschen van den Soenda-Molukschen Archipel. *Ibid.*

——. Bydrage tot de kennis der Pleuronecteoïden van den Soenda-Molukschen Archipel. *Ibid.*

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ERRATA.

Page 30, line 25 from bottom, *read* the third not quite twice as long as the second.

,, 97, ,, 5 from bottom, *Lutjanus lunulatus*, Bl. Schn. p. 329, is to be erased.

,, 98, ,, 8 from bottom, *Serranus aurantius*, Cuv. & Val. ii. p. 305. is to be erased.

,, 169, Plate XIV. fig. A. is to be erased.

CATALOGUE

OF

FISHES.

Subclass I. TELEOSTEI.

Fishes with ossified skeleton and completely separated ertebræ; the posterior extremity of the vertebral column either bony, or covered with bony plates. Bulb of the aorta simple, with two opposite valves at the origin; branchiæ free.

Order I. ACANTHOPTERYGII.

Part of the rays of the dorsal, anal, and ventral fins not articulated, forming spines. The inferior pharyngeal bones separated. Air-bladder, if present, without pneumatic duct.

Cfr. Müller, in Berl. Abhandl. 1844, p. 199.

Fam. 1. GASTEROSTEIDÆ.

Form of body elongated, compressed; eyes lateral; cleft of mouth extending on the sides of the muzzle, oblique; villiform teeth in both the jaws and on the pharyngo-branchials, none on the palate or on the tongue. Three branchiostegals. Opercular bones not armed; infraorbital arch articulated with præoperculum; parts of the skeleton forming external mails. Scales none, or in the form of scaly plates along the side. Isolated spines before the dorsal fin; ventral fins abdominal, but pubic bones attached to the humeral arch; ventral with one strong spine, and generally with another single short ray. Swim-bladder simple, oblong; cæca pylorica in small number.

Fresh and brackish waters and seas of both the Arctic regions.

Only one genus.

1. GASTEROSTEUS*.

Gasterosteus, *Artedi, Genera*, p. 52; *Linn. Syst. Nat.* p. 489; *Cuv. Règne Anim.*; *Cuv. & Val.* iv. p. 479.
Centriscus, *Klein, Pisc. Miss.* iv. p. 48.
Gasterosteus and Spinachia, *Flem. Brit. Anim.* p. 219

Characters the same as of the family.

1. Gasterosteus aculeatus.

Pungitius piscis, *Albert. Magn. Aldror.* v. cap. 36.
—— alberti, *Jonston*, iii. cap. 3.
Pisciculi aculeati prius genus, *Rondel.* ii. p. 206; *Gesner*, fol. 160 *a*.
Pisciculus aculeatus, *Willughby*, p. 341. t. 10. f. 1; *Ray*, p. 145.
Gasterosteus, no. 1, *Artedi, Species*, p. 96; *Gronov. Zoophyl.* n. 405.

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* *Doubtful species*:—

1. Obolarius aculeatus, *Steller*.—Gasteracanthus cataphractus, *Pallas*, .—Gasterosteus cataphractus, *Tiles. Mém. Acad. Pétersb.* iii. p. 226. pl. 8. f. 1.—Gasterosteus obolarius, *Cuv. & Val.* iv. p. 500.—Coast and Rivers of Kamtschatka.
2. Gasterosteus niger, *Cuv. & Val.* iv. p. 503.—Newfoundland.
3. Gasterosteus plebeius, *Girard, l. c.* p. 147, and *U. S. Pacif. R. R. Exped. Fishes*, p. 86.—California.
4. Gasterosteus inopinatus, *Girard, ll. cc.*—California.—The two latter fishes prove that the form of the three-spined Stickleback with the posterior part of the side naked is also met with in North America, but even there limited to the more temperate parts. The characters given by Girard otherwise are too vague to admit of any opinion on the specific right of these fishes.
5. Gasterosteus pygmæus, *Agass. Lake Superior*, p. 314. pl. 4. f. 1.—Lake Superior.
6. Gasterosteus inconstans, *Kirtland, in Boston Journ. Nat. Hist.* iii. p. 273. pl. 2. f. 1.—Ohio.
7. Gasterosteus serratus, *Ayres, Proc. Cal. Acad. Nat. Sc.* i. 1855, p. 47; *Girard in U. S. Pacif. R. R. Exped. Fishes*, p. 88.—California.
8. Gasterosteus intermedius, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 135, and *U. S. Pacif. R. R. Exped. Fishes*, p. 89.—Cape Flattery.
9. Gasterosteus pugetti, *Girard, U. S. Pacif. R. R. Exped. Fishes*, p. 92.—Fort Steilacoom, Puget's Sound.
10. Gasterosteus microcephalus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 133, and *U. S. Pacif. R. R. Exped. Fishes*, p. 91.—Four Creeks, Tulare Valley, U.S.
11. Gasterosteus loricatus, *Reinh. Vidensk. Selsk. Natur. og Math. Afh.* vii. 1838, p. 193.—Greenland.
12. Gasterosteus dimidiatus, *Reinh. l. c.*—Greenland

Gasterosteus aculeatus, *Linn. Syst.* p. 489; *Gronov. Syst. ed. Gray*, p. 167; *Bloch*, t. 53. f. 3; *Bl. Schn.* p. 122; *Donov. Brit. Fishes*, i. pl. 11; *Turton, Brit. Faun.* p. 101; *Flem. Brit. An.* p. 219; *Fries och Ekstr. Skand. Fisk.* p. 17. t. 4. f. 1; *Thompson, Ann. & Mag. Nat. Hist.* 1841, vii. p. 95; *White, Catal. Brit. Fishes*, p. 35.
Centriscus, sp., *Klein, Pisc. Miss.* iv. p. 48. t. 13. f. 4, 5.
Gasterosteus ter-aculeatus, *Lacép.* iii. p. 296.

D. 1 | 1 | $\frac{1}{10-12}$. A. $\frac{1}{8-9}$. P. 10. V. 1/1. Cæc. pylor. 2. Vert. 15/16.

Sides of the body with a more or less complete series of scaly plates. The two anterior dorsal spines one-third of the height of the body.

Var. A. GASTEROSTEUS GYMNURUS.

Gasterosteus gymnurus, *Cuv. Règne Anim.*
—— leiurus, *Cuv. & Val.* iv. p. 481. pl. 98. f. 4; *Yarr. Ann. & Mag. Nat. Hist.* iii. p. 522, and *Brit. Fishes*, i. p. 95; *Owen, Catal.* p. 56; *Coste, Mémoires Sci. Sav. Etrang.* x. 1848; *Günther, Neckarfische*, p. 29.
Quarter-armed Stickleback, *Parn. Ichth. Frith of Forth*, p. 30. t. 25.

Four or five scaly plates above the pectoral fin; the remainder of the body naked.

Middle and Southern parts of Europe; England, France, South Germany, Baltic.

a. Adult. New River. Museum Leach.
b–e. Adult. Greenwich. Presented by W. Yarrell, Esq.
f, g. Adult. Poole Heath, Dorset. Presented by W. Thompson, Esq.
h–k. Adult. Wandsworth. Museum Leach.
l, m. Adult. Lochend.
n. Adult. Duddington Loch.
o–r. Adult. England.
s. Adult: not good state. Baltic. From the Haslar Collection.
t. Adult. From the Haslar Collection.
u. Half-grown: bad state.
v–y. Half-grown. Presented by Dr. Johnston.
z. Half-grown. Museum Leach.
α. Adult.
β. Adult: skeleton.

Var. B. GASTEROSTEUS SEMIARMATUS.

Gasterosteus semiarmatus, *Cuv. & Val.* iv. 493; *Yarr. l. c.* f. 127 *b*, and *Brit. Fishes*, i. p. 94; *Parn. l. c.* p. 32. t. 22.

The front part of the side with a series of ten to fifteen scaly plates.

France; Belgium; England.

a–d. Adult. Greenwich. Presented by W. Yarrell, Esq.
e, f. Adult. Tweed. Presented by Dr. Johnston.

Var. C. GASTEROSTEUS SEMILORICATUS.

Gasterosteus semiloricatus, *Cuv. & Val.* iv. p. 494; *Thompson, l. c.* p. 95.

The series of scaly plates reaching to the front end of the caudal keel.
France; Ireland.

Var. D. GASTEROSTEUS TRACHURUS.

Gasterosteus trachurus, *Cuv. & Val.* iv. p. 481. pl. 98. f. 1; *Yarr. l. c.* f. 127 *a*, and *Brit. Fishes*, i. p. 90; *Parn. l. c.* p. 33. t. 25.
—— aculeatus, *Ekström, Fische Mörkö*, p. 153.
—— trachurus, var. pontica, *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 357.

The sides of body and tail entirely covered with a series of scaly plates.

Northern parts of Europe; North Germany, England, France.

a. Adult. Greenwich. Presented by W. Yarrell, Esq.
b. Adult. Marsh at Plymouth. Museum Leach.
c. Adult. Poole Heath, Dorset. Presented by W. Thompson, Esq.
d, *e*. Adult. Tweed. Presented by Dr. Johnston.
f. Adult. England. Presented by Mr. Moore.
g. Adult. Frith of Forth.
h–*k*. Half-grown. Frith of Forth.
l–*n*. Adult. Gotha River, Sweden.
o. Half-grown. Norway. Presented by G. Woodfall, Esq.
p–*u*. Fine specimens. From the Haslar Collection.
v, *w*. Adult. From the Haslar Collection.
x–*α*. Half-grown. From the Haslar Collection.
β–*δ*. Adult. Europe.
ε–*θ*. Young. Europe.

Var. E. GASTEROSTEUS NOVEBORACENSIS.

Gasterosteus aculeatus, *Schœpff.*
—— noveboracensis, *Cuv. & Val.* iv. p. 502. pl. 98. f. 3; *Dekay, New York Fauna, Fishes*, p. 66. pl. 6. f. 17 (bad).

Entirely similar to the preceding variety, but with the ventral spine rather longer, reaching to the posterior extremity of the pubic bone.

Fresh waters of the northern parts of North America.

a. Adult. Greenland.
b. Several young specimens. North America.

2. Gasterosteus argyropomus.

Gasterosteus argyropomus, *Cuv. & Val.* iv. p. 498.

$$\mathrm{D.}\ 1 \mid 1 \mid \tfrac{1}{12}.\quad \mathrm{A.}\ \tfrac{1}{10}.\quad \mathrm{P.}\ 9.\quad \mathrm{V.}\ 1/1.$$

Sides without any plates; the anterior dorsal spines about one-third of the height of body.

Italy.

a–*e*. Fine specimens. Rome. Presented by W. C. Trevelyan, Esq.

3. Gasterosteus brachycentrus.

Gasterosteus brachycentrus, *Cuv. & Val.* iv. p. 499. pl. 98. f. 2; *Thompson, l. c.* p. 100; *Yarr. Brit. Fishes,* i. p. 96; *Heck. Kner, Süsswasserfische,* f. 17.
—— aculeatus, var., *White, Catal. Brit. Fishes,* p. 35.

D. 1 | 1 | $\frac{1}{13}$. A. $\frac{1}{9}$. P. 10. V. 1/1.

Three or four scaly plates above the pectoral fin. The anterior dorsal spines only one-fifth of the height of the body; the ventral spine one-third of the length of the os innominatum.
Italy.

4. Gasterosteus biaculeatus.

Gasterosteus biaculeatus, *Shaw, Zool.* iv. p. 608; *Penn. Arct. Zool.* ii. p. 385; *Cuv. & Val.* iv. p. 503.
—— cuvieri, *Girard, Bost. Journ.* vi. p. 254. pl. 7. f. 1.

D. 1 | 1 | $\frac{1}{12}$. A. $\frac{1}{8}$. P. 9. V. 1/1.

Sides of the tail without scaly plates. The ventral spine with a spinous process at the outer side of its base. Blackish.
Coasts of Newfoundland and Labrador.

Gasterosteus biaculeatus, Dekay, New York Fauna, Fishes, p. 65, pl. 3. f. 9, is a different fish, probably identical with *Gasterosteus noveboracensis.* Strangely enough he says, "Vent with an anterior pouch, analogous to that observed in *Syngnathus.*" (?)

5. Gasterosteus tetracanthus.

Gasterosteus tetracanthus, *Cuv. & Val.* iv. p. 499.

D. 1 | 1 | 1 | $\frac{1}{15}$. A. $\frac{1}{10}$. P. 11. V. 1/1.

Sides of the posterior part of body naked; the anterior dorsal spines shorter than one-third of the height of the body. (*Cuv.*)
Italy.

6. Gasterosteus spinulosus.

Gasterosteus spinulosus, *Jen. & Yarr.*; *Jen. Man.* p. 350; *Stark, Jameson's Edinb. Journ.* 1830, p. 327; *Yarr. Brit. Fishes,* i. p. 97; *Parn. l. c.* p. 36. t. 25.
—— aculeatus, var., *Thompson, l. c.* p. 103.

D. 1 | 1 | 1 | $\frac{1}{8}$. A. $\frac{1}{8}$. P. 9. V. 1/1.

Sides of the posterior part of body naked; the anterior dorsal spines about one-fourth of the height of the body; the ventral spine does not reach the posterior extremity of the pubic bone.
Fresh waters of Great Britain.

a. Adult. Isle of Arran. Museum Leach.
b. Half-grown. Berwick. Presented by Dr. Johnston.

7. Gasterosteus pungitius.

D. $9\,|\,\frac{1}{9}$. A. $\frac{1}{9-10}$. P. 11. V. 1/1.

Nine very short isolated dorsal spines; the tenth spine two-thirds lower than the second dorsal. Sides naked, the caudal keel sometimes with very thin scales.

Northern parts of Europe: England, France, North Germany, Baltic. Northern parts of America; Newfoundland; New York.

A. *European variety*: GASTEROSTEUS PUNGITIUS.

Pisciculi aculeati alterum genus, *Rondel.* ii. p. 206.
Pisciculus pungitivus, *Gesner*, fol. 160 *a*.
—— aculeatus minor, *Willughby*, p. 342; *Ray*, p. 145.
Pungitii alterum genus, *Aldrov.* v. cap. 36; *Jonston*, tab. 28. fig. *a.* (left-hand figure).
Gasterosteus no. 2, *Artedi, Spec.* p. 97; *Gronov. Zoophyl.* n. 406.
—— pungitius, *Linn. Syst.* p. 491; *Gronov. Syst. ed. Gray*, p. 167; *Bl.* ii. p. 108. t. 53. f. 4; *Bl. Schn.* p. 123; *Lacép.* iii. p. 297; *Donov. Brit. Fishes*, ii. pl. 32; *Pallas, Zoogr.* iii. p. 228; *Turton, Brit. Faun.* p. 101; *Flem. Brit. Anim.* p. 219; *Cuv. & Val.* iv. p. 506; *Thompson, l. c.* p. 103; *Ekström, Fische Mörkö*, p. 159; *Fries och Ekstr.* p. 20. pl. 4. f. 2; *Yarrell, Brit. Fishes*, i. p. 99; *Parn. l. c.* p. 37. t. 26; *White, Catal. Brit. Fishes*, p. 36.

a. Adult. Battersea Fields. Museum Leach.
b–d. Adult. Cobham (Surrey). Museum Leach.
e. Many specimens. Gotha River, Sweden.
f. Adult: not good state. Baltic. From the Haslar Collection.
g, h. Adult.
i, k. Half-grown. From the Haslar Collection.

B. *American variety*: GASTEROSTEUS OCCIDENTALIS.

Gasterosteus occidentalis, *Cuv. & Val.* iv. p. 509; *Dekay, New York Fauna*, p. 68. pl. 42. f. 135.
—— pungitius, *Storer, Rep. Mass.* p. 32.
—— nebulosus, *Agass. Lake Superior*, p. 310. pl. 4. f. 2.

l–n. Adult. North America.

8. Gasterosteus mainensis.

Storer, Bost. Journ. i. p. 464.

D. $7\,|\,\frac{1}{9}$. A. $\frac{1}{8}$.

Back with seven spines, the last longest; a broad oblong serrated plate on the side, with numerous dusky transverse bands.

Fresh water. Maine.

9. Gasterosteus concinnus.

Richardson, Faun. Bor.-Amer., Fishes, p. 57.

D. $7\,|\,\frac{1}{9}$. A. $\frac{1}{9}$. V. 1/1.

The eighth spine one-third lower than the second dorsal. No scales whatever on the body. (*Rich.*)

Fresh waters from the Saskatchewan to the Great Bear Lake.

This species may be identical with the former.

10. Gasterosteus quadracus.

Gasterosteus quadracus, *Mitch. Trans. Lit. & Phil. Soc.* i. p. 430. pl. 1. f. 11 (bad); *Cuv. & Val.* iv. p. 504; *Dekay, New York Fauna*, pl. 6. f. 18.

—— apeltes, *Cuv. & Val.* iv. p. 505; *Storer, Report*, p. 31.

? —— millepunctatus, *Ayres, Bost. Journ. Nat. Hist.* iv. p. 294. pl. 12. f. 3.

$$\text{D. } 3\text{–}4 \,\Big|\, \tfrac{1}{12}. \quad \text{A. } \tfrac{1}{10}.$$

No bony cuirass between the ventral fins; without any scaly plates, and no keel on the side of the tail.

Fresh waters of New York.

11. Gasterosteus spinachia.

Aculeatus vel Pungitius marinus longus, *Schonev.* p. 10. t. 4. f. 3; *Willughby*, p. 340; *Ray*, p. 145.

Gasterosteus no. 3, *Artedi, Genera*, p. 52; *Gronov. Zoophyl.* no. 407.

—— spinachia, *Linn. Syst.* p. 492; *Bloch*, t. 53. f. 1; *Bl. Schn.* p. 123. t. 33. f. 2; *Lacép.* iii. p. 301; *Donov. Brit. Fishes*, ii. pl. 45; *Turt. Brit. Faun.* p. 101; *Flem. Brit. Anim.* p. 219; *Cuv. & Val.* iv. p. 509; *Ekstr. Fische Mörkö*, p. 163; *Fries och Ekstr.* p. 21. t. 4. f. 3; *Jen. Man.* p. 351; *Yarrell, Brit. Fishes*, i. p. 101; *Thompson, l. c.* p. 104; *Parn. l. c.* p. 38. pl. 26; *White, Catal. Brit. Fishes*, p. 36.

Centriscus, sp., *Klein, Pisc. Miss.* iv. p. 48. no. 1. t. 4. f. 5.

Gasterosteus marinus, *Gronov. Syst. ed. Gray*, p. 168.

Spinachia vulgaris, *Flem. Brit. Anim.* p. 219.

D. 15 | 6–7. A. 6–7. P. 10. V. 1/1. Cæc. pylor. 2.
Vert. 18/23.

Back with fifteen free spines. Body laterally covered with scaly plates.

Along all the northern European coasts.

a. Adult. Plymouth. Museum Leach.
b. Adult: skin. Plymouth. From Mr. Yarrell's Collection.
c–h. Adult. Brighton. Presented by J. G. Children, Esq.
i. Adult. Brighton. Presented by Dr. A. Günther.
k. Adult. English Channel.
l. Large female specimen. Wales. Presented by Mrs. Gray.
m–p. Half-grown. South Wales. Presented by F. Stokes, Esq.
q. Adult. Berwick on Tweed. Presented by Dr. Johnston.
r. Very large specimen: not good state. Polperro. Presented by J. Couch, Esq.
s–w. Adult and half-grown specimens. Frith of Forth.
x–ι. Adult and half-grown specimens. Europe.

Fam. 2. BERYCIDÆ.

Form of body oblong or rather elevated, compressed; eyes lateral, large; cleft of mouth extending on the sides of the muzzle, more or less oblique; villiform teeth in both the jaws, and generally on the palate. Eight or four branchiostegals. Opercular bones more or less armed. Scales ctenoid, seldom bony, or wanting. Ventral fins thoracic, with more than five soft rays, in one genus with less. Cæca pylorica in increased number.

Tropical and temperate seas.

The genera of this most natural family have been improperly scattered by Cuvier in the families of Triglidæ and Percidæ. *Lowe* was the first who defined this group, in his admirable work on the "Fishes of Madeira." He overlooked, however, the genus *Rhynchichthys*, apparently a less aberrant form than *Monocentris*, which may be considered as a connecting link with the first family.

Synopsis of the Genera.

Scales forming a bony mail; several isolated spines in front of the dorsal fin	1. MONOCENTRIS.
One dorsal. No vomerine teeth. Abdomen serrated	2. HOPLOSTETHUS.
One dorsal. Vomerine teeth. Abdomen serrated.	3. TRACHICHTHYS.
No scales	4. ANOPLOGASTER.
One dorsal. Vomerine teeth. No barbel......	5. BERYX.
Two barbels	6. POLYMIXIA.
Two dorsals. Præopercular spine none........	7. MYRIPRISTIS.
Two dorsals. Præopercular spine. Jaws equal, or the lower prominent	8. HOLOCENTRUM.
Two dorsals. Præopercular spine. Snout projecting beyond the mouth..............	9. RHYNCHICHTHYS.

1. MONOCENTRIS.

Gasterosteus, sp., *Houttuyn.*
Sciæna, sp., *Thunberg.*
Monocentris, *Bl. Schn.* p. 100; *Cuv. & Val.* iv. p. 461.
Lepisacanthus, *Lacép.* iii. p. 321.

Muzzle blunt, rounded, protruding, with the cleft of mouth beneath; eye moderate. Villiform teeth in both the jaws and on the palatines, but none on the vomer. Eight branchiostegals. Opercular bones scarcely denticulated; suborbital bones with radiating bony ridges. Scales very large, bony, forming together a mail. Several isolated spines in front of the dorsal. Ventrals reduced to a single strong spine and a few very short rays; caudal not forked. Swim-bladder?

Sea of Japan.

1. Monocentris japonicus.

Gasterosteus japonicus, *Houttuyn, Act. Soc. Harl.* xx. pt. 2. p. 329.
Sciæna cataphracta, *Thunberg, Nov. Act. Scient. Suec.* xi. p. 102. tab. 3.
Monocentris carinata, *Bl. Schn.* p. 100. tab. 24 (copied).
Lepisacanthus japonicus, *Lacép.* iii. p. 321.
Monocentris japonicus, *Cuv. & Val.* iv. p. 461. pl. 97; *Faun. Japon.* p. 50. pl. 22. f. 1.

D. 6 | 11. A. 10. P. 13. V. 1/2. L. lat. 13. L. transv. 2/4.

Anterior dorsal and ventral spines very strong and thick. Head shorter than the height of the body.

Sea of Japan.

a. Adult. Japan.
b. Adult: skin in spirits. Purchased of Mr. Frank.
c, *d*. Adult: stuffed. China Seas.
e. Half-grown: stuffed. Purchased.

2. HOPLOSTETHUS.

Hoplostethus, *Cuv. & Val.* iv. p. 469.
Trachichthys, sp., *Lowe, Fishes of Madeira,* p. 55.

Muzzle very short, rounded, not protruding; cleft of mouth oblique; eye large. Exceedingly fine villiform teeth in both the jaws and on the palatines, but none on the vomer. Eight branchiostegals. Operculum entire, a strong spine on the scapular bone and at the angle of præoperculum; suborbital arch with radiating ridges. Scales ctenoid, of moderate size; abdomen serrated. One dorsal with a spinous and with a soft portion; ventrals with six soft rays; pectoral blunt and rounded behind; caudal deeply forked. Swim-bladder simple; pyloric appendages numerous.

Mediterranean; coast of Madeira.

1. Hoplostethus mediterraneus.

Hoplostethus mediterraneus, *Cuv. & Val.* iv. p. 469. pl. 97 bis.; *Guichenot, Explor. Algérie, Poiss* p. 42.
Trachichthys pretiosus, *Lowe, Suppl. Fishes of Madeira, in Proc. Zool. Soc.* 1839, p. 77, and *Fishes of Madeira,* p. 55. tab. 9.

D. $\frac{6}{13}$. A. $\frac{3}{9}$. V. 1/6. L. lat. 28–29. Vert. 11/15.

Pectoral fin reaching beyond the origin of the anal fin; the serrated ventral keel composed of eleven to thirteen scales. Pale reddish or rose-coloured.

Mediterranean; coast of Madeira.

a. Adult. Madeira. Presented by the Zoological Society.

Skeleton.—Cfr. Owen, Osteol. Catal. i. p. 56.

3. TRACHICHTHYS.

Trachichthys, *Shaw, Nat. Misc.* x. pl. 378, *Cuv. & Val.* iii. p. 229
Amphiprion, *Bl. Schn.* p. 551.
Trachichthys, sp., *Lowe, Fishes of Madeira,* p. 55.

Muzzle very short, rounded, not protruding; cleft of mouth oblique; chin prominent, eye large. Exceedingly fine villiform teeth in both the jaws, on the palatines, and on the vomer. Eight branchiostegals; a strong spine on the scapular bone and at the angle of præoperculum, a small one on the operculum; suborbital arch with radiating ridges. Scales ctenoid, rather small, abdomen serrated. One dorsal, ventral with six soft rays; caudal forked. Swim-bladder? Pyloric appendages?

Australian Sea.

1. **Trachichthys australis.**

Trachichthys australis, *Shaw, Nat. Misc.* tab. 378, and *Zool.* iv. p. 630; *Cuv. & Val.* iii. p. 229; *Lowe, Fishes of Madeira,* p. 55 *et seq.*
Amphiprion carinatus, *Bl. Schn.* p. 551.

D. $\frac{3}{12}$. A. $\frac{2}{10}$. V. 1/6. P. 13.

Scales rough, rather irregularly arranged, those of the lateral line not larger; the serrated ventral keel composed of eight scales. The height of the body not quite one-half of the length between snout and the base of the caudal.

Australian Sea.

a. Adult: stuffed. New Holland. (Shaw's original specimen.)

2. **Trachichthys elongatus.** (Plate 1. fig. A.)

D. $\frac{4}{11}$. A. $\frac{3}{9}$ V. 1/6. L. lat. ca. 65.

Scales rough, those of the lateral line not larger; the serrated ventral keel composed of eleven or twelve scales. The height of the body one-third of the length between snout and the base of the caudal.

a Skin, in spirits. Great Barrier Island (New Zealand). Purchased of Mr. Sowerby.

b. Young. Australia.

Description.—This new species differs as much in the form of the body from the other, as a Dace from a Crucian Carp. The length of the head is less than the height of the body. The snout is exceedingly short, about one-third of the diameter of orbit. The upper maxillary reaches a little behind the eye; it is elongate and styliform like the intermaxillary, but dilated at the end. The lower jaw is shorter than the upper, and furnished in front with two little knobs; the intermaxillaries are scarcely separated from one another by a notch. All the teeth are fine, villiform; those of the jaws and palatine bones in narrow bands, and those of the vomer in a small patch.

The interspace between the eyes is one-third of the length of the head, and convex; the scales of the nape extend nearly to above the middle of the eye. The remainder of the upper surface of the head is scaleless, and occupied by cavities. There are two narrow bony ridges running from the nape to the front of the snout; they converge in the middle, including posteriorly a narrow triangular cavity. Between these ridges and the superciliary margin there is on each side another ridge, slightly arched, and running from the suprascapulary to the posterior nostril; there is a pair of large cavities between these and the inner ridges; lastly, there is a third cavity between the ridge just mentioned and the superciliary arch. This latter cavity is absent in *Beryx affinis,* the outer ridge and the superciliary margin being confluent in that species. The nostrils are close together; the anterior small, round; the posterior larger, short, ovate. The eye is placed high up the sides, its diameter is nearly one-third of the length of the head. The infraorbital arch is transformed into a channel, covered by a half-transparent skin, like the cavities of the skull; several bony ridges cross it; the anterior infraorbital is very narrow in front and scarcely denticulated; none of the bones extend to the præoperculum.

The operculum is not twice as high as wide; no scales are visible on it, except at its upper extremity, but broad ridges, rough and slightly arched; the spine at its upper angle is scarcely visible. The suboperculum is entire, and notched before the pectoral; the interoperculum is rough and slightly serrated. The præoperculum has on the hinder and under part two parallel ridges with a channel between; they are slightly roughened and meet at a right angle, where there is a projecting triangular spine with a sharp bony ridge; the edges of this spine have a fine, hardly visible serrature. The spine does not extend to the gill-opening. Cheek scaly. The scapulary bone has a distinct spine, much more feeble than in the other species. Humeral bone not serrated.

The dorsal fin is placed somewhat nearer the base of the caudal than the tip of the snout; its height equals its length. The spines and rays are much more slender than in *Trachichthys australis,* and not roughened. The spines become longer behind; the fourth is about as long as the last ray, one-half of the longest; the longest ray is the third, much longer than one-half of the depth of the body. The caudal is moderately forked, with pointed lobes of moderate length, about one-fifth of the total. The origin of the anal falls under the end of the dorsal, it is rather higher than long, but much lower than the dorsal; the spines and rays are smooth, the former gradually becoming longer behind; the third spine is much shorter than the first ray (which is the longest), and even somewhat shorter than the last. The pectorals are slightly rounded, short, their length being one-seventh only of the total. The ventrals equal the pectorals in length; they are inserted a little behind the pectorals; their spine is equal to the third of the anal fin.

The scales are smaller and smoother and more regularly arranged than in *Trachichthys australis*; their margin is strongly ciliated. The scaly plates between the root of the ventrals and the anus are imbricate, each armed with a strong spine directed backwards. Along the middle of each lobe of the caudal fin a black streak.

	inches.	lines.
Total length	4	1
Height of the body	1	2
Length of the head	1	0
——— of maxillary bone	0	6
——— of fourth dorsal spine	0	4
——— of third dorsal ray	0	8
——— of first anal ray	0	5½

4. ANOPLOGASTER.

Hoplostethus, sp., *Cuv. & Val.* ix. p. 470.

Muzzle very short, rounded, not protruding; cleft of mouth oblique, chin prominent; eye large. Villiform teeth in both the jaws, several larger ones in the lower, none on the palate. Eight branchiostegals. Operculum entire, a strong spine at the angle of præoperculum; suborbital arch with radiating ridges. Scales none; skin covered with rough tubercles. One dorsal, ventral with six soft rays; pectoral pointed?, caudal deeply forked. Swim-bladder?

Tropical parts of the Atlantic.

1. Anoplogaster cornutus.

Hoplostethus cornutus, *Cuv. & Val.* ix. p. 470.

D. $\frac{3}{12}$. A. $\frac{2}{6}$. V. 1/6.

Suborbital arch with seven cavities; the bony ridges of the head terminating in several blunt points. (*Val.*)

5. BERYX.

Cuv. Règne Anim.; *Cuv. & Val.* iii. p. 226.

Muzzle short, with oblique cleft of mouth and prominent chin; eye large. Villiform teeth in both the jaws, on the vomer and palatine bones. Eight (exceptionally seven) and more branchiostegals. Opercular bones serrated; operculum generally distinctly spiniferous; præoperculum without spine. Scales moderate or large, ctenoid. One dorsal; ventrals with seven and more rays. Caudal forked; anal with four spines. Air-bladder simple. Pyloric appendages in increased number (20–30).

Sea of Madeira; Indian Ocean; Australian Seas.

1. Beryx lineatus.

Cuv. & Val. iii. p. 226.

B. 8. D. $\frac{6}{13}$. A. $\frac{}{15}$. V. 1/7. L. lat. 51. L. transv. 7/17. Cæc. pylor. ca. 20.

The height of the body is one-third of the total length, the length of the head one-fourth. Operculum with two small spines; pectoral one-fifth of the total length; the inferior lobe of the caudal rather longer than the superior. Red, with lighter longitudinal bands.

King George's Land.

a. Adult: stuffed: not good state. (Isle de France.)

2. Beryx affinis. (Plate II.)

D. $\frac{7}{12}$. A. $\frac{4}{12-13}$. V. 1/7. L. lat. 41–43. L. transv. 6/12.

The height of the body is $3\frac{1}{4}$ in the total length, the length of the head $3\frac{2}{3}$; operculum with two distinct spines; pectoral one-fifth of the total length; the inferior lobe of the caudal scarcely longer than the superior.

Coasts of Australia.

a–c. Adult: stuffed. Australia. Purchased of Mr. Warwick.
d. Adult: has been in chloride of zinc. From the Haslar Collection.

Description.—This species is closely allied to *B. lineatus*, but differs in many respects, which, unimportant in themselves, altogether lead me to think it a distinct species.

The form is oblong, moderately compressed, deepest forwards from the nape to the commencement of the soft portion of the dorsal fin, contracting considerably at the origin of the anal. The dorsal line is strongly arched from the front end of the dorsal fin to the tip of the short muzzle. There is another convexity, but much slighter, along the base of the dorsal fin. The ventral line is straight between the origin of the anal and the mandibular joint, rising steeply towards the extremities of snout and tail. The greatest height of the body at the origin of the dorsal fin, is $3\frac{1}{4}$ in the total length. The length of the head equals the height above-named. The large eye is placed high up, but not interfering with the upper outline of head; it leaves a space below it deeper than its diameter, which is nearly one-third of the length of head. The muzzle is short, reaching about five-sixths of the diameter of the eye. The nostrils of one side are close together, one before the other; the anterior is placed a little lower, and is oval and small; the posterior is larger and more elongated.

The intermaxillaries are thin at the sides, separated in front from one another by a deep notch; they are furnished with a band of very fine villiform teeth, and with several larger ones at the inner extremity, near the notch; their upper posterior processes are rather small and feeble. The palatine bones are armed with a cuneiform band of minute teeth, the broader end in front; the small patch of vomerine teeth is triangular. The lower jaw is thickened and clumsy at the tip, which projects considerably beyond the upper, and is received into its notch; the lateral edge is slightly undulating and furnished with a series of small teeth, but the teeth on the anterior prominence are, like the upper ones, larger and conical. The maxillaries are styliform at the interior extremity, but very broad at the exterior; they are smooth, and not denticulated; the broad end is overlapped by the supplementary bone, tapering behind and roughened above. The gape is oblique, steeply ascending; the maxillary reaches, when the mouth is closed, rather behind the middle of the eye.

The eye is surrounded by the infraorbital arch, which is transformed into a channel, the outer side of which is covered above by a narrow, bony, roughened streak, and beneath by a broad transparent membrane; the lower edge of the arch is slightly serrated. The præorbital has not the curved and prominent tooth which is to be observed in *B. decadactylus* and *splendens*; but in this species such a process arises from the maxillary, near its upper extremity, in front of the eye. The turbinal bones are peculiarly shaped and have curved edges; they are roughened in front and laterally denticulated, and have a notch, to receive the curved process of the maxillary bone.

The interspace between the eyes becomes gradually narrower in front, and is one-fourth of the length of the head. There may be distinguished four very narrow bony ridges; each of the two external ones forms the superciliary ridge, terminates abruptly in an obtuse extremity just above the nostrils, and is lost behind in the infraorbital arch. The two internal ridges arise from one point on the same level with the front end of the two external ones, and on the suture of the frontal bones; they immediately diverge, receiving an arrow-shaped groove between, and radiate near the nape into three bony ridges, the inner of which is very short, but the two outer ones extend nearly to the suprascapular. Between all these ridges are cavities covered by a half-transparent membrane only.

The operculum is more than twice as high as wide (the spine included); it is covered with scales on its anterior half, the remainder being striated; the striæ terminate in marginal points, becoming coarser towards the spines; there is a slight notch above and beneath the spines. The upper spine is rather stronger, and produces a distinct transverse ridge on the opercle; both the spines have a parallel direction and are rather distant from one another. The suboperculum has a concave posterior margin and has some spinous teeth below. The interoperculum has a very deep notch near the angle of præoperculum, and is not only serrated along its margin, but has a roughened surface, sometimes with projecting spines. The præoperculum has two parallel margins with a channel between, covered with a half-transparent membrane. Both the posterior margins have an exceedingly fine serrature; that of the inferior ones is coarser. The margins meet at a right angle, slightly projecting, and armed with coarse spinous teeth. The cheek is scaly. The suprascapular has a prominent spine, rather larger than those of the operculum and running in the same direction; it might be taken for a third opercular spine. The scapular and coracoid bones are nearly entire. The scales of the nape reach far between the eyes.

The dorsal fin is more distant from the occiput than from the root of the caudal; the distances are =3 : 2. The spines gradually become longer behind, the length of the first being 5½ in that of the seventh; the first ray is still longer—one-half of the height of the body, and nearly twice as long as the last; it is branched. The length of the base of the dorsal fin is much longer than the pectoral; its origin corresponds to the level of the 7th scale of the lateral line, its end to that of the 27th. The spines are rather slender, and show sometimes a longitudinal groove.

The caudal fin is exceedingly deeply forked, one of the longest outer rays being more than four times as long as the middle, and as long as the head; both the lobes appear to be equal in length (the extremities are rather injured). The upper and lower side of the base is furnished with four short imbricate spines.

The length of the base of the anal fin nearly equals that of the pectorals; its origin corresponds to the level of the 15th scale of the lateral line, its end to that of the 32nd. The spines are slender and become gradually longer behind; the fourth is rather shorter than the first ray, which equals the sixth dorsal spine, and is more than twice the length of the last; its lower edge is straight.

The pectoral fin is placed about one-third of the height up the side, not very long, and pointed, equaling one-fifth of the whole length of the fish. The rays are regular and slender; the first two unbranched; the third the longest.

The ventral fins are placed just below the base of the pectorals; they are ovate and much shorter than the latter, their length being one-seventh only of the total. The spine is strong, striated, about three-fourths of the entire length of the fin. A narrow elongated scale at their exterior axil.

The scales are of moderate size, with smooth surface and fine posterior serrature; in several of the dorsal scales the middle part of the serrature projects beyond the margin. The lateral line is nearly straight, uninterrupted.

The specimens are now discoloured, but appear to have been red, with iridescent streaks.

	inches.	lines.
Total length	14	0
Height of body	4	4
Length of head	3	10
——— of seventh dorsal spine	1	9
——— of first dorsal ray	2	10
——— of longest caudal ray	3	5½
——— of middle caudal ray	0	8½
——— of fourth anal spine	1	6
——— of first anal ray	1	6½
——— of pectoral	2	6
——— of ventral	1	9

3. Beryx decadactylus.

Beryx decadactylus, *Cuv. & Val.* iii. p. 222; *Barker-Webb & Berthelot, Hist. Nat. Iles Canar. Ichthyol.* p. 13. pl. 4.
Beryx splendens, *Lowe, Cambr. Phil. Trans.* vi. tab. 3 (not descript.).

B. 8 (7). D. $\frac{4}{16-19}$. A. $\frac{3-4}{28-29}$. V. 1/10. L. lat. 64–65. L. transv. 34–35.

The height of the body is equal to the length of the head, and $2\frac{1}{2}$ in the total. The upper maxillary bone reaches to below the middle of the eye. Operculum with an indistinct spine.

Sea of Madeira.

4. Beryx splendens.

Lowe, Proc. Zool. Soc. 1833, p. 142; *Cambr. Phil. Trans.* vi. p. 197 (not figure); *Fishes of Madeira,* p. 47. pl. 8.

B. 8 (9). D. $\frac{4}{13-15}$. A. $\frac{4}{26-29}$. V. 1/10–13. L. lat. 71–76. L. transv. 8/20. Cæc. pylor. 25–30.

The height of the body is equal to the length of the head, and three to four times in the total. The upper maxillary bone reaches to below the middle of the eye. Operculum with two feeble spines.

·Sea of Madeira.

a. Adult. Madeira. Presented by the Rev. R. T. Lowe.
b. Large specimen: stuffed: not good state. Madeira. From the Collection of the Zoological Society.

5. Beryx delphini.

Cuv. & Val. ix. p. 454; *Cuv. Règne Anim. Ill. Poiss.* pl. 14. f. 3.

B. 10. D. $\frac{5}{16}$. A.? V. 1/13. Cæc. pylor. 24.

Taken from the stomach of a dolphin in the Indian Ocean.

6. POLYMIXIA.

Polymixia, *Lowe, Trans. Cambr. Phil. Soc.* 1838, vi. p. 198.
Nemobrama, *Valenc. in Barker-Webb & Berthelot, Ichth. Iles Canar.* p. 40.

Muzzle short, with nearly horizontal cleft of mouth, and the upper jaw longest; eye large. Villiform teeth in both the jaws, on the vomer, the palatine and pterygoid bones. Four branchiostegals. Two barbels on the throat. Operculum without spine; præoperculum indistinctly crenulated. Scales moderate. One dorsal; ventrals with six or seven rays. Caudal forked; anal with three or four spines.

Atlantic Ocean.

1. Polymixia nobilis.

Polymixia nobilis, *Lowe, l. c.* tab. 4.
Nemobrama webbii. *Val. l. c.* p. 41. pl. 8.

D. $\frac{5}{36-38}$. A. $\frac{3-4}{16-18}$. V. 1/6 or 7. L. lat. 48–54. Vert. 29.

Above uniform greenish; dorsal and anal black anteriorly.
Sea of Madeira, and St. Helena.

a. Adult. Madeira. Presented by the Rev. R. T. Lowe.
b. Adult: stuffed. St. Helena. Presented by General Hardwicke.
c. Adult: stuffed. Old Collection.

One of the specimens exhibits seven rays in the ventral fins, as stated by Valenciennes. There are even eight in the figure given by him.

2. Polymixia lowei. (Plate VII. fig. A.)

D. $\frac{5}{30}$. A. $\frac{3}{16}$. V. 1 7. L. lat. 50.

Above uniform greenish; sides golden shining (in spirits).
Caribbean Sea.

a. Adult. Cuba. From the Collection of the Zoological Society.

Description of the specimen.—This species very much resembles in general appearance the only one hitherto known, but differs in having at least six dorsal rays less. The height of the *body* is nearly equal to the length of the head, and $3\frac{3}{4}$ in the total. The greatest depth of the body is below the origin of the dorsal fin; in front of this point the upper profile is slightly convex, but rapidly descends from the eye to the snout; the profile behind that point gradually descends to the caudal fin. The lower profile is nearly straight between the snout and the anal fin.

The *head* has an obtuse and short snout, with the upper jaw overlapping the lower; the interspace between the eyes is one-fourth of the length of the head, and is covered with scales to near the anterior margin of the eyes. The cleft of mouth is wide, the upper maxillary reaching to behind the eye; it terminates posteriorly in a broad plate with a convex posterior edge and a concave superior and inferior one. The lower jaw has a slight prominence in front, much smaller than in *Myripristis*, &c. The eye is placed high up the sides, but does not interfere with the upper profile of head; its diameter is rather more than one-third of the length of head; the space below it is less than its diameter. The suborbital arch is broader as far as the maxillary reaches, and transformed into a half-channel, covered with a transparent skin. This part of the suborbital arch, the maxillary, and the dentary, are scaleless; all the remainder of the sides of the head is covered with scales of moderate size.

The *opercles* have no spines at all; the operculum and suboperculum are so uniformly covered with scales, that the border between them can be seen only after the scales are removed. The former is twice as high as wide, and the lower margin is straight, obliquely descending upwards; the sub- and inter-operculum have rounded lower margins, and both are situated in an oblique direction upwards. The præoperculum has a scaleless portion at its angle, which is rounded and indistinctly crenulated; the posterior margin descends obliquely towards behind. Of the humeral arch the suprascapula alone is slightly denticulated.

The two *barbels* arise in front of the branchiostegals from the basihyal (Owen), and reach as far behind as the base of the pectoral fin.

Pseudobranchiæ well developed.

The *dorsal fin* arises above the middle of the fish (the caudal not included), with five feeble spines, gradually becoming longer behind, but the fifth being about one-half only of the first ray, which is the longest; the following rays become shorter and shorter to the seventeenth, the remainder being very short and nearly equal in length. The last ray is one-fourth only of the first. The distance between the dorsal and caudal fins is 3½ in the length of the former. The *caudal fin* is deeply forked, with pointed and equal lobes; the length of a lobe is about one-fifth of the total, and that of the middle (shortest) ray is one-fourth of the length of a lobe. The *anal fin* is similar in shape to the dorsal, but much shorter and lower. The third spine is about one-third of the first ray, which equals the fifth dorsal ray; the end of the fin falls just below that of the dorsal. The *pectorals* are short, pointed; they reach beyond the level of the origin of the dorsal, and are equal in length to that of the first dorsal ray. The *ventral fins* are very short; their spine is closely attached to the first ray, and both can be separated from one another by the knife only; the first ray is not branched, but articulated; the length equals the diameter of the eye, and the fin reaches scarcely beyond the pectoral.

The *scales* are rather oblique and irregular, with distinct concentric layers on the free part and without serrature.

All the *teeth* are in very broad, velvet-like bands; that of the intermaxillary is elongate, cuneiform, broadest on its inner extremity; nearly all the band is not covered by soft parts, and free, outside of the mouth; the band of the mandibulary is narrower and undulating. One broad band extends on the palatine and pterygoid bones, and confluent with it is an exceedingly large and ovate patch of teeth on the *entopterygoid bone*. The vomerine teeth form a narrow band, tapering behind. The tongue and the branchial bones are covered with broad patches of villiform teeth. Thus this fish offers the most complete dentition in this and the following families.

	inches.	lines.
Total length	9	10
Height of the body	2	7
Length of the head	2	8
Diameter of the eye	0	11
Interspace between the eyes	0	8
Length of a barbel	2	0
Breadth of the entopterygoid patch of teeth	0	5

	inches.	lines.
Length of the entopterygoid patch of teeth	0	9
——— of the first dorsal ray	1	4
——— of the last dorsal ray	0	4
——— of a caudal lobe	2	0
——— of the middle caudal ray	0	6
——— of the first anal ray	1	1
——— of pectoral fin	1	4
——— of ventral fin	0	11
Height of a scale	0	4
Length of a scale	0	3

7. MYRIPRISTIS*.

Myripristis, *Cuv. Règne Anim.*; *Cuv. & Val.* iii. p. 160.

Muzzle short, with oblique cleft of mouth † and prominent chin; eye generally large. Villiform teeth in both the jaws, on the vomer and palatine bones. Eight (exceptionally seven) branchiostegals. Opercular bones serrated; operculum generally with a spine, præoperculum without spine. Scales large, ctenoid. Two dorsals, scarcely united; ventrals with seven rays. Caudal forked; anal with four spines. Swim-bladder divided by a contraction; the anterior part extending to the otocrane. Pyloric appendages in moderate number.

Tropical seas of both hemispheres.

1. Myripristis jacobus.

Cuv. & Val. iii. p. 162.

D. 10 $\big| \frac{1}{14-15}$. A. $\frac{4}{13}$ V. 1/7. L. lat. 36–38. L. transv. 3/6.
Cæc. pylor. 9. Vert. 27.

The height of the body is one-third of the total length, the length of the head one-fourth; the interspace between the eyes is one-fourth of the length of the head. The upper maxillary reaches a little to behind the middle of the eye; operculum striated, the striæ terminating in fine points at the hinder edge of the operculum, above a very feeble spine. Pectoral shorter than ventral; the third and fourth anal spines nearly equal in length, but the former broader. Gill-opening and base of pectoral fin brownish black.

Caribbean Sea; coast of Brazil.

a. Adult. Brazil. Presented by Lord Stuart.
b–e. Adult: skins. Jamaica. From Dr. Parnell's Collection.
f. Adult. Sine patria. From the Haslar Collection.
g. Adult: stuffed. Sine patria.
h. Young. Sine patria. From the Haslar Collection.

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* 1. Myripristis borbonicus, *Cuv. & Val.* vii. p. 489.—Isle de France.
2. —— axillaris, *Cuv. & Val.* vii. p. 491.—Isle de France
3. —— botche, *Bleek. Perc.* p. 52.—Batavia.
4. —— violaceus, *Bleek. Banda*, i. p. 234.—Banda.

† In *Myripristis lima* the cleft of mouth is horizontal.

2. Myripristis pralinius.

Myripristis pralinius, *Cuv. & Val.* iii. p. 170, and vii. p. 486.
Myripristis seychellensis, *Cuv. & Val.* iii. p. 172.

D. $10 \mid \frac{1}{15\text{–}16}$. A. $\frac{4}{14\text{–}15}$. L. lat. 38. L. transv. 3/6.

The height of the body is three times in the total length, the length of the head $3\frac{1}{2}$; the interspace between the eyes is $4\frac{1}{2}$ in the latter. The upper maxillary bone reaches to below the middle of the eye, and is distinctly denticulated beneath; a series of larger teeth along the outer margin of the upper jaw. Striæ and denticulations of the opercular pieces very fine; opercular spine indistinct. Pectoral longer than ventral, reaching to the level of the anus; the third and fourth anal spines are nearly equal in length, but the former is rather thicker. Red, with the upper part of the gill-opening and the base of pectoral black.

From the Isle de France through the Indian Ocean to the Pacific.

a. Adult. Celebes. From Mr. Frank as *M. indicus*.
b–d. Adult: stuffed. Louisiade Archipelago. Voyage of the Rattlesnake.
e. Adult. India.

3. Myripristis kuntee.

Sullanaroo-kuntee, *Russ. Cor. Fishes*, pl. 104.
Myripristis kuntee, *Cuv. & Val.* vii. p. 487.

D. $10 \mid \frac{1}{16}$. A. $\frac{4}{13}$.

The height of the body is one-third of the total length; the interspace between the eyes rather narrower than one-fourth of the length of the head; the fan-like ridges on the head five or six in number; maxillary bone not serrated; teeth carduliform along the edge of the upper jaw. Shoulder, gill-opening, and base of the pectorals brownish black. (*Val.*)

Coast of Coromandel. Isle de France.

This species may prove to be the same as *M. pralinius*, the denticulation of the maxillary bone being a character of very little value.

4. Myripristis bleekeri.

Myripristis pralinius, *Bleek. Banda*, i. p. 234 (not *Cuv.*).

D. $10 \mid \frac{1}{15}$. A. $\frac{4}{13\text{–}14}$. L. lat. 40.

The height of the body is $3\frac{1}{5}$–$3\frac{2}{5}$ in the total length, the length of the head 4–$4\frac{1}{2}$; the interspace between the eyes is $3\frac{1}{3}$–$3\frac{1}{2}$ in the latter, vertex with 8 to 10 bony ridges on each side, fan-like arranged. In front of both the jaws some larger teeth; the upper maxillary bone reaches to behind the middle of the eye, and is denticulated at the inferior angle. Opercular spine feeble. The dorsal fins nearly equal in height; pectorals longer than ventrals.

Red, the upper part of the gill-opening and the base of the pectoral black. (*Bl.*)

Sea of Banda Neira.

5. Myripristis leignathos.

Valenc. Voy. Vénus, v. p. 316. pl. 4. f. 1.

D. 11 | $\frac{1}{12}$. A. $\frac{4}{13}$. L. lat. 38.

The height of the body is 3 times in the total length, the length of the head $3\frac{3}{4}$; the interspace between the eyes is one-fourth of the length of the head. No larger teeth in the jaws; the upper maxillary reaches to behind the middle of the eye, and is not denticulated; scapulary entire. Uniform red. (*Val.*)

New Ireland.

6. Myripristis parvidens.

Bleek. Amb. Ceram, p. 260; ? *Cuv. & Val.* iii. p. 173.

D. 10 | $\frac{1}{13-14}$. A. $\frac{4}{12-13}$. L. lat. 30.

The height of the body is $3\frac{1}{4}$ or 3 in the total length, the length of the head $3\frac{3}{4}$; the interspace between the eyes is $3\frac{1}{2}$ in the length of the head. No larger teeth in the jaws; the upper maxillary reaches to behind the middle of the eye, and is not denticulated; operculum with a feeble spine; scapulary entire. Violet-reddish; fins rose-coloured, the outer rays of the caudal violet; opercular membrane and base of the pectoral deep black. (*Bl.*)

Sea of Amboyna.

7. Myripristis murdjan.

Sciæna murdjan, *Forskal*, p. 48.
Perca murdjan, *Schneider*, p. 86; *Lacép.* iv. pp. 396, 418.
Russell, t. 105.
Myripristis murdjan, *Cuv. & Val.* iii. p. 177, vii. p. 495; *Rüppell, Atl.* p. 86. t. 23. f. 2, and *Fische des Rothen Meers*, p. 95; *Bleeker, Amboina*, iii. p. 19.

B. 8 (7). D. 10 | $\frac{1}{13-14}$. A. $\frac{4}{12-13}$. L. lat. 28–30. L. transv. 3/6.
Vert. 10/15.

The height of the body is contained $3\frac{1}{4}$ in the total length, the length of the head $3\frac{3}{4}$; the interspace between the eyes is two-ninths of the latter. The upper maxillary reaches behind the middle of the eye. Operculum with a feeble spine above; the upper maxillary with some denticulations; suboperculum notched before the pectoral fin. Pectoral reaching a little beyond the ventral to the level of the eleventh scale of the lateral line; the third anal spine stronger, but rather shorter than the fourth. Rose-coloured, scales with a violet edge; the soft dorsal, anal, and ventral fins with a white front margin, and the anterior rays with a violet-brownish cross-band; caudal fin above and beneath white-edged, and each lobe with a violet-brownish longitudinal streak.

Red Sea; Amboyna.

a. Half-grown: stuffed. Red Sea. From the Frankfort Museum.
b. Adult. India. From Mr. Frank's Collection.
c, *d*. Adult. India.

8. **Myripristis adustus.**

Bleeker, Amboina, iii. p. 18.

D. $10 \mid \frac{1}{15}$. A. $\frac{4}{11-12}$. L. lat. 28–30. Vert. 11/15.

The height of the body is $3\frac{1}{4}$ in the total length, the length of the head $3\frac{3}{4}$; the interspace between the eyes is one-fourth of the latter. The upper maxillary bone reaches to behind the middle of the eye; operculum with a short feeble spine. Pectoral reaching a little beyond the ventral to the level of the tenth scale of the lateral line. The third anal spine stronger, but rather shorter, than the fourth. Above reddish-violet, scales with a violet edge; gill-opening and base of the pectoral black; the spinous dorsal violet; the other vertical fins rose-coloured, with broad black tips.

Sea of Amboyna.

a, *b*, *c*, *d*. Adult. Amboyna. From Mr. Frank's Collection.
e, *f*. Adult. Sine patria. From Mr. Frank's Collection.
g. Half-grown. Amboyna. From Mr. Frank's Collection.

Skeleton.—The bones forming the roof of the skull are so closely attached to one another and show such continuous ridges, that it is nearly impossible to point out the sutures between the single bones without separating them altogether. The supraoccipital crest is limited to the posterior part, without extending on its upper surface. There are two principal ridges longitudinally running along the middle of the interspace between the eyes. Leaving posteriorly a narrow cavity between them, they are close side by side anteriorly, and then diverge to form a short triangular groove for the posterior processes of the intermaxillary bones. Between each of these ridges and the orbit is an elongate cavity, tapering at both ends; the longer posterior part belongs to the principal frontal bone, the shorter anterior to the turbinal; both the turbinal bones receive between them the short groove for the processes of the intermaxillaries; from about the middle of the upper part of the orbit arises another ridge, similar to those mentioned, and running backwards soon radiates into branches, which again bifurcate and form the fan-like expansion characteristic of the species of *Myripristis* and *Holocentrum*.

The maxillary bone is styliform in its inner half, then suddenly widens into a broad plate, with an acute angle behind and a rounded one in front; the latter is furnished with several granular prominences; the supplementary bone is oblong, about four times as long as broad, and has a styliform upper process. The intermaxillaries are separated from one another by a small notch, they are three-fourths as long as the maxillary, and have a slight prominence behind. The mandibularies are rather short and high; each is distinguished by a small protuberance in front.

The *dentition* is chiefly formed by broad bands of fine villiform teeth; at several places are small, short, granular prominences, similar to those of the angle of maxillary, and more like apophyses than true teeth. Such granulations may be seen strongest in front of both the jaws, on the protuberances of the bones, but moreover also on the outer edges of intermaxillary and mandibulary. The band of the upper jaw is nearly twice as broad as that of the dentary bone; both reach to the extremities of their bones. All the other teeth are exceedingly fine and velvet-like; those of the vomer form a triangular patch with concave sides, those of the palatines a cuneiform band, broad anteriorly, and do not extend beyond that bone. The teeth of the pharyngo-branchials are placed in an ovate group with several smaller ones besides.

The *infraorbital* arch is rather narrow and nearly equally broad, the præorbital not being widened on account of the shortness of the snout. It is transformed into a bony half-channel, the open side of which is covered by a thin membrane, and the edges of which are finely serrated. The arch has inside a narrow, concave, and thin plate for supporting the eye-ball from beneath. The *entopterygoid* is very broad, and attached to the basisphenoid by a narrow ligament only, so that the bottom of the orbit is nearly entirely bony.

All the *opercles* are distinctly striated as far as they are not covered by scales. The operculum is more than twice as high as wide; on its upper third it has a flat ridge terminating in a distinct point, above and below which is a slight notch; the serrature is fine, but distinct. The suboperculum is narrow, with a shallow notch before the pectoral fin, and three or four very slight denticulations beneath. The interoperculum is two and a half as long as high, distinctly, but more finely serrated than the operculum, and has a convex lower margin. The præoperculum is distinguished by two nearly parallel serrated edges; the posterior pair is finely serrated, like the interoperculum, the serrature of the supplementary ridge being rather indistinct; the inferior pair has both the edges equally and finely serrated. Both the pairs meet at a rather obtuse angle, and here the serrature is somewhat stronger and more like that of the operculum.

The skull of *Myripristis* shows the remarkable peculiarity of a large oval opening, closed by an elastic membrane—an *internal tympanum*. The opening appears to belong to the alisphenoid bone; at the bottom of the cavity is placed a large otolith. The membranaceous cover is in immediate connexion with the lobe of the anterior part of the air-bladder, and attached to it is an elastic, bony, excavated plate, in form similar to the tragus of the common Bat, and arising from the lower posterior angle of the opening. A similar form of connexion between the air-bladder and the vestibulum is found in *Holocentrum*, *Priacanthus macrophthalmus*, *Sparus*, *Sargus*, *Salpa*, &c.

The *humeral* arch is likewise striated and serrated, but more so at the bones which are situated higher up the sides. The humeral is formed as in the Percidæ generally, but rather shorter; the urohyal is triangular, short and broad.

The *pubic bones* are peculiarly shaped, short, much higher (in the vertical line) than broad (in the horizontal); they are attached to one another with an upper suture, terminating in a point anteriorly, and with a second very concave one in front. They form together a trihedral cavity with the entrance from beneath; each of them terminates behind in a broad process, which together form a plate, in form not unlike one of the scales of the fish. There is another styliform process along the entrance to that cavity, arising from the symphysis of the bases of the ventral fins.

The hyal and branchial apparatus show no peculiarity.

There are eleven abdominal and fifteen caudal *vertebræ*, the length of the abdominal part of the vertebral column being $1\frac{1}{3}$ in that of the caudal. The hæmal spines are stronger and somewhat longer than the neural. Twelve ribs; the fourth to the eighth rib have another small rib (epipleural spine) attached; but such epipleurals, belonging to the posterior ribs, are inserted on the vertebræ themselves. The ribs of the eleventh vertebra are very broad, sword-shaped, and separated from one another. The strongest interhæmal is apparently formed by two, belonging to the second and third dermohæmals; it has a deep longitudinal groove, and is as long as the first eight vertebræ together.

9. Myripristis microphthalmus.

Bleek. Cer. Amb. p. 261.

D. $10 \mid \frac{1}{14-15}$. A. $\frac{4}{12-13}$. L. lat. 30.

The height of the body is $2\frac{4}{5}$ in the total length, the head is one-fourth; the interspace between the eyes is one-fourth of the length of head, and the diameter of the eye is $2\frac{1}{2}$ in the same. Several larger canine-like teeth in the jaws; the upper maxillary bone denticulated, reaching to behind the middle of the eye. Scapulary entire. Rose-coloured, the scales of the back with violet margin; fins rose-coloured; root of the pectoral black. (*Bl.*)

Sea of Amboyna.

10. Myripristis vittatus.

Cuv. & Val. vii. p. 492.

D. $10 \mid \frac{1}{14}$. A. $\frac{4}{12}$.

The upper maxillary bone with five or six distinct denticulations; the spine of operculum very indistinct; operculum striated; the third anal spine very strong and thick. On each side five or six blackish longitudinal bands; the vertical fins yellow, the others reddish; no black at the gill-opening, or at the base of the pectoral fin. (*Val.*)

Sea of Isle de France.

11. **Myripristis japonicus.**

Myripristis japonicus, *Cuv. & Val.* iii. p. 173. pl. 58; *Faun. Japon.* p. 23. pl. 9 *a*; *Richardson, Ichth. China,* p. 222.
? Myripristis pralinius, *Richardson, l. c.* p. 223.

D. 11 | $\frac{1}{14}$. A. $\frac{4}{11}$. L. lat. 27–29. L. transv. 3/7.

The height of the body is equal to the length of the head (opercular spine included), and one-third of the total; the interspace between the eyes is one-sixth of the length of head. The upper maxillary bone reaches a little behind the middle of the eye, and is not denticulated. The operculum is strongly striated, the striæ terminating in points at the posterior edge; a very strong and long opercular spine, each scale with one or more stronger spinous teeth in the middle of the posterior edge; the third anal spine much stronger and also longer than the fourth, about the same size as the opercular spine. Uniform red.

Japanese Sea; Isle de France.

a. Large specimen: stuffed. Japan. Purchased.
b. Adult: stuffed. Isle de France. From Dr. Janvier's Collection.
c. Half-grown: skin in spirits.
d. ? Half-grown: skin in spirits. China. Presented by J. R. Reeves, Esq. (Lateral line 30. D. 11 | $\frac{1}{13}$. A. $\frac{4}{12}$.)

12. **Myripristis trachypoma.** (PLATE III.)

B. 8. D. 11 | $\frac{1}{13}$. A. $\frac{4}{10-11}$. V. 1/7 P. 15. C. $\frac{4-3}{25}$. L. lat. 29. L. transv. 3/7.

The height of the body is nearly equal to the length of the head (opercular spine included), and $2\frac{3}{4}$ in the total; the interspace between the eyes is one-sixth of the length of head. All the teeth villiform; the upper maxillary bone reaches behind the middle of the eye, and is not denticulated. Opercles covered with spines, and operculum with a rather strong spinous prominence; scales ctenoid, but the denticulations equal; the third anal spine much stronger and also longer than the fourth. Red, with longitudinal bands.

Caribbean Sea.

a. Adult. Cuba.
b. Adult. West Indies. Purchased of Mr. Scrivener.

Description.—This new species is entirely different from the other one from the West Indies, viz. *Myripristis jacobus,* and is closely allied to *Myripr. japonicus.*

Two characters alone justify a separation from the latter—the scales in the Japanese species having one or two spinous teeth, stronger than the other part of the serrature, and the much larger size of the opercular spine. The form of the body is the same.

All the *teeth* are villiform, except those which cover the two prominences in front of the lower jaw. The lateral margin of the lower jaw is not straight, but undulating; the vomerine teeth form a small obtuse-angled triangle. The upper maxillary bone is very broad behind, about half as broad as long; the supplementary bone elongate, sword-shaped, and covered with minute spines, like the lower jaw. The *eye* is about one-third of the length of head (opercular spine included), and nearly circular. There are the bony ridges and grooves on the upper surface of the skull, covered with a thin and half-transparent skin, as in the other species of *Myripristis*: an elongate groove extends from the occiput to the middle of the space between the eyes; on the hinder part it is half divided into two by a narrow longitudinal ridge. In the middle of the forehead are two ridges, divergent posteriorly and anteriorly, forming posteriorly the cavity mentioned, and in front a space for the upper processes of the intermaxillary; these ridges are in direct contact with one another, remaining separated in other species. Between each of these ridges and the orbit is situated another elongate cavity, tapering at both ends, and extending beyond the nostril. On the sides of the vertex are two or three bony ridges with a rough surface, but they are not fan-like arranged, as in other species. The suborbital arch is transformed into one continuous cavity, the bony edges of which are conspicuous and finely serrated. All the opercular pieces are striated, *and each streak terminates in a small spine before reaching the posterior edge of the bone,* the bones thus receiving a rough, spinous appearance. The opercle is narrow, with a transverse keel towards the top, ending in a strong prominent spine, of about the size of the first dorsal spine; along its base is a series of ctenoid scales; there is a notch above the spine, but the lower edge is straight and spiniferous. The subopercle is very narrow, with a sinus just before the base of the pectoral fin, and a slight transverse ridge beneath, terminating in a small point. The margin above the sinus is slightly convex and spiniferous. In the interopercle may be distinguished a straight posterior edge, a right angle, and a rather undulating lower margin; it is spiniferous in all its circumference. The preopercle exhibits two concentric ridges, finely serrated, and with a channel-like cavity between; the cavity is again covered with a transparent skin; the angle is rounded; the cheeks are covered with scales.

There are six scales between the occiput and the first dorsal spine. The spinous *dorsal* is $2\frac{1}{3}$ as long as the soft, but nearly equal in height; they are united by a low membrane, reaching from the eleventh to the twelfth spine. The third, fourth and fifth spines are longest, the fourth twice as long as the first; the eleventh is only half the size of the first. The twelfth spine, or the first of the soft dorsal, is a little longer than the preceding, and placed on the level of the seventeenth scale of the lateral line. The fourth and fifth rays are longest, their length being contained $2\frac{1}{2}$ in the greatest depth of body.

The *anal* fin commences opposite the second dorsal with a minute spine; the second is considerably larger, the third longest and strongest, not quite as long as the third dorsal one; posteriorly it is provided with a deep furrow, in which the fourth spine together with the connecting membrane may be hidden. This fourth spine has the strange appearance of being composed of two spines, one shorter anterior and one longer posterior, both being separated by a longitudinal furrow; this spine is as long as the first dorsal one. The first ray is articulated, but not bifid; the second is longest, even a little longer than the longest dorsal ray; the following rays gradually decrease in length, and the end of the anal falls short behind that of the dorsal.

The *caudal* fin is moderately forked, and its length is contained $5\frac{1}{3}$ in the total.

The *pectorals* reach to the level of the anus, are rather pointed, and their base falls below the first dorsal spine. The first ray is only one-third of the length of the fin, and not branched as the second; the fourth and fifth are longest.

The *ventrals* are shorter than the pectorals, placed immediately below their root, and do not reach as far behind; they are composed of a strong, flat, striated spine, not much shorter than the longest ray, and of seven branched rays. There is a deformity on one side of one of the specimens, which, if present on both the sides, or in a dried specimen, one-half of which only is preserved, might lead to the creation of a nominal species, or even genus: viz. on the right side there are, besides the long outer spine, five rays only, and a small inner spine instead of the two others. The spines of all the fins are striated.

The *scales* are smooth, finely and equally serrated on the posterior edge; the largest ones are placed, not in the lateral line, but in two series below that; they are twice as high as long, and one of the largest covers not even one-third of the eye.

The colour appears to have been red, without any spot; there are longitudinal bands visible along each series of scales; the bands are silvery above the lateral line, and slightly reddish (shining golden in life?) beneath.

	inches.	lines.
Total length	7	5
Length of head	2	8
——— of eye	0	9
Interspace between the eyes	0	$5\frac{1}{2}$
Greatest height of body	2	10
Length of fourth dorsal spine	1	1
——— of third anal spine	0	$11\frac{1}{2}$
——— of ventral spine	1	2
Height of a large scale	0	7
Length of a large scale	0	$3\frac{1}{2}$

13. Myripristis hexagonus.

Lutjanus hexagonus, *Lacép.* iv. p. 213.
Myripristis hexagonus, *Cuv. & Val.* iii. p. 171, vii. p. 489; *Voy. de l'Astrol., Poiss.* p. 674. pl. 14. f. 5 (not good).

D. $10 \mid \frac{1}{14}$. A. $\frac{4}{13}$. L. lat. 33. L. transv. 3/7.

The height of the body is three times in the total length, the length of the head $3\frac{1}{4}$; the interspace between the eyes one-fifth of the length of the head. Operculum with a very distinct spine; the upper maxillary reaches far behind the middle of the eye, and is denticulated beneath. Suboperculum not notched. Pectoral reaching a little beyond the ventral, to the level of the fifteenth scale of the lateral line; the third anal spine much stronger and also longer than the fourth. Red; the front edges of the soft dorsal, of anal, and of ventrals, and the upper and lower edges of the caudal, pure white. Gill-opening and a spot in the arm-pit brownish black.

Seas of Isle de France, Boeroe.

a. Adult. Mauritius. From the Collection of the Zoological Society.

14. Myripristis lima.

Cuv. & Val. vii. p. 493; *Règne Anim. Ill. Poiss.* pl. 14. f. 2.

D. $11 \big| \frac{1}{14}$. A. $\frac{4}{11}$. V. 1/7. L. lat. 46–47.

The height of the body is equal to the length of the head, and one-third of the total; the interspace between the eyes is one-sixth only of the length of the head. The lower jaw has a horizontal direction, and not an oblique one, as in the other species of *Myripristis*. Operculum with three or four distinct points at the angle. Caudal not deeply forked, with rounded lobes. Uniform red. (*Val.*)

Sea of Isle of France.

8. HOLOCENTRUM*.

Holocentrum, *Artedi in Seba*, iii. tab. 27. f. 1; *Cuv. & Val.* iii. p. 182.
Corniger, *Agass. in Spix, Pisc. Bras.* p. 121.

Muzzle moderate, nearly horizontal; jaws equal in front, or the lower slightly prominent; eye large. Villiform teeth in both the jaws, on the vomer and on the palatine bones. Eight branchiostegals. Opercular bones and suborbitals serrated; operculum with two spines, a large spine at the angle of præoperculum. Scales moderate, ctenoid. Two dorsals, scarcely united; ventrals with seven rays. Caudal forked; anal with four spines, the third very long and strong. Swim-bladder simple, oval. Pyloric appendages in increased number.

Tropical Seas of both hemispheres.

1. Holocentrum longipinne.

Jaquaraca, *Marcgr.* p. 147; *Lichtenst. Abhandl. Berl. Acad.* 1820, p. 279.
Catesby, Hist. Nat. Carol. ii. pl. 2. f. 2.
Matejuels, *Parra*, p. 23. pl. 13. f. 2.

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* 1. Perca ascensionis, (*Linn.*) *Osbeck, Reise nach China*, p. 388.—Amphacanthus ascensionis, *Bl. Schn.* p. 210.—Lutjanus ascensionis, *Lacép.* iv. p. 197.—Holocentrum ascensionis, *Cuv. & Val.* iii. p. 212.—Ascension Island.

2. Holocentrum argenteum, *Cuv. & Val.* vii. p. 502; *Voy. Astrol., Poiss.* p. 677. pl. 14. f. 2.—New Guinea.

3. Holocentrum marianum, *Cuv. & Val.* iii. p. 219.—Martinique.

4. Holocentrum leonoides, *Blk. Perc.* p. 54.—Celebes.

5. Holocentrum binotatum, *Blk. Goram.* p. 207.—Goram.

Bodianus pentacanthus, *Bloch.* t. 225 (very bad); *Shaw, Zool.* iv. p. 570. pl. 83 (very bad).
—— jaguar, *Lacép.* iv. p. 286 (bad).
Sciæna rubra, *Bl. Schn.* p. 82 (not *Forsk.*).
Amphiprion matejuels, *Bl. Schn.* p. 206.
Holocentrus sogho, *Bloch.* t. 232.
Holocentrum longipinne, *Cuv. & Val.* iii. p. 185, vii. p. 496.

D. 11 | 15. A. $\frac{4}{11}$. V. 1/7. L. lat. 47–50. L. transv. 4 7. Cæc. pylor. 25. Vert. 11/16.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head four times; the interspace between the eyes is $6\frac{1}{2}$ in the latter (opercular spine included). Operculum with two flat spines, the lower of which is the smaller. The third and fourth dorsal spines longest, the soft dorsal fin as high as the body; the length of the caudal is $3\frac{1}{2}$ in the total, the upper lobe much longer; the third and fourth anal spines longest, but the former much longer and stronger; the ventral fins reach near to the anus, much longer than pectoral. Reddish, with more or less distinct shining longitudinal bands.

Caribbean Sea; Coast of Brazil.

a. Fine specimen. Cuba. Presented by the Zoological Society.
b. Adult. Cuba. Presented by the Zoological Society.
c–k. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.
l. Half-grown. St. Christophers. Presented by Dr. J. E. Gray.
m. Adult. West Indies. From the Haslar Collection.
n, o. Adult: not good state. West Indies.
p–r. Adult: stuffed. West Indies. From Mr. Scrivener's Collection.
s. Half-grown: stuffed: not good state. Bahia.
t. Adult. America. Presented by the Zoological Society
u–x. Adult: stuffed. America.
y. Half-grown. America. Presented by the Zoological Society.

2. **Holocentrum furcatum.** (Plate IV.)

D. 11 | 16. A. $\frac{4}{10}$. L. lat. 50. L. transv. 4 7.

The height of the body is equal to the length of the head, and not quite one-fourth of the total length. The interspace between the eyes is $6\frac{3}{4}$ in the length of the head. Snout shorter than the diameter of the eye; the upper maxillary reaches nearly to below the middle of the eye. Operculum with one very large spine and several very small ones beneath; the præopercular spine one-half of the length of the posterior edge of præoperculum, the second to fifth dorsal spines longest, not quite one-half the height of the body; the soft dorsal fin elongate; caudal very deeply forked, with slender and elongate lobes, the upper much longer than the lower. The third anal spine longest, but one-eighth only of the total length Red, with lighter longitudinal bands.

a. Adult: stuffed. South Sea.

Description of the specimen.—This species would belong to those with the form of the body elevated but for its long and slender caudal fin and the posterior part of the tail, which is narrower than in other species, but stouter than in *H. longipinne.*

The lower jaw is slightly prominent, and the upper maxillary reaches nearly to below the middle of the eye. The length of the snout is six-sevenths of the diameter of eye. The upper profile of the head is slightly convex; the two bony ridges between the eyes run nearly parallel, and distant from one another, to receive in front the groove for the processes of the intermaxillary bones, which is equal in length to that of the snout. The fan-like expansion is formed by about ten or eleven radiating ridges; the turbinal bones do not terminate in a prominent process. The diameter of the eye is one-third of the length of head; the anterior suborbital has a strong prominent tooth in front. The opercles are irregularly striated. The operculum terminates in an uncommonly strong spine, beneath which are several very small ones, not much larger than the other denticulations of the margin. The sub- and interoperculum have four or five small spinous teeth in their upper third; the remainder of the margins is entire. The præoperculum has a vertical posterior margin, finely serrated, and a strong and straight spine at the angle; the lower margin is indistinctly serrated.

The spines of the dorsal fin are strong, the second to fifth longest. The soft dorsal is rather elongate; the first ray is equal in length to the fifth spine, the third not quite twice as long and the last one-third only of the first. The upper lobe of the caudal fin is very elongate, its length is $3\frac{2}{3}$ in the total; the lower is $4\frac{3}{5}$ in the same length. Also the soft part of the anal fin is rather elongate, longer than the third spine, but lower than the dorsal. The pectorals are much shorter than the elongate ventrals; they reach to the level of the sixteenth scale of the lateral line, whilst the extremity of the latter corresponds to the twenty-first.

The scales are distinctly serrated on all the posterior margin. The coloration appears to have been red in life, with lighter longitudinal bands; the fins are now entirely uniform.

	inches.	lines.
Total length	10	11
Height of the body	2	$9\frac{1}{2}$
Length of the head	2	$9\frac{1}{2}$
Interspace between the eyes	0	$4\frac{2}{3}$
Length of the snout	0	10
——— of opercular spine	0	$4\frac{1}{3}$
——— of præopercular spine	0	$6\frac{1}{3}$
——— of third dorsal spine	1	3
——— of first dorsal ray	1	$2\frac{1}{3}$
——— of third dorsal ray	1	$9\frac{1}{3}$
——— of last dorsal ray	0	4
——— of superior caudal lobe	3	0
——— of inferior caudal lobe	2	4
——— of third anal spine	1	$4\frac{1}{2}$

	inches.	lines.
Length of fourth anal spine	1	0
——— of first anal ray	1	5
——— of last anal ray	0	5½

3. **Holocentrum macropus.** (PLATE I. fig. B.)

· D. 11 | 15. A. $\frac{4}{9}$. L. lat. 52. L. transv. 4/7.

Body rather elongate. Ventral fins very long, as long as the head. Operculum with a very strong spine, and a very small one beneath; præopercular spine moderate, one-third of the length of the posterior margin of præoperculum.

a. Adult: stuffed. Isle de France. Purchased of Sir A. Smith.

Description of the specimen.—Although the greater part of the fins in the specimen are injured, I do not hesitate to found on it a species, as the ventrals are well preserved, and offer a character whereby it may be distinguished from every other species of the genus. In the measurements given *in this species, the total length is to be understood from the snout to the root of the caudal fin only*, as this fin is nearly entirely lost.

The height of the body is nearly equal to the length of the head, and $3\frac{3}{5}$ in the total; the interspace between the eyes is $6\frac{1}{4}$ in the length of the head; the two bony ridges radiate behind in about ten branches. The snout is pointed, its length being $\frac{5}{6}$ths of the diameter of the eye; the groove for the processes of the intermaxillary bones is still shorter; the turbinal bone does not terminate in an anterior prominent spine: the upper maxillary reaches not quite to below the middle of the eye. The diameter of the eye is $3\frac{2}{5}$ in the length of the head; all the surrounding infraorbital bones are serrated and the anterior is armed in front with a very strong curved tooth. The operculum is distinctly striated, the striæ terminating in fine marginal points; the upper spine is very strong, as in *H. furcatum*, whilst the inferior resembles more one of the other denticulations. The suboperculum has also some striæ, terminating in spinous points, coarser than those of the operculum. Interoperculum striated and serrated. Both the edges of the præoperculum are finely serrated, like the operculum; the spine at the angle is of moderate length.

The third, fourth and fifth dorsal spines are longest, nearly one-half the height of body. The soft dorsal has no spine in front, and does not appear to have been elevated. The caudal fin has been forked. The first spine of the anal is minute, the second smaller than the opercular spine, the third strongest, scarcely longer than the longest of the dorsal fin, the fourth is a little shorter than the fourth; the first ray is rather elongate, and higher than the longest of the dorsal fin. The pectorals are short, and probably have not reached further than to the level of the eleventh or twelfth scale of the lateral line. The ventral fins are formed by one spine and seven soft rays; the former is slender, and as long as the third anal spine; of the rays the third is longest, equal to the height of the body, and reaching to the level of the twenty-third scale of the lateral line.

The scales are finely serrated.

The coloration appears to have been red, with longitudinal bands of a dusky colour.

	inches.	lines.
Total length	9	$2\frac{1}{2}$
Height of the body	2	$6\frac{1}{2}$
Length of the head	2	$6\frac{1}{2}$
Interspace between the eyes	0	$4\frac{2}{3}$
Length of opercular spine	0	3
——— of præopercular spine	0	5
——— of fourth dorsal spine	1	3
——— of last dorsal spine	0	$5\frac{1}{2}$
——— of third anal spine	1	$3\frac{1}{3}$
——— of fourth anal spine	1	0
——— of first anal ray	1	$6\frac{1}{3}$
——— of ventral spine	1	$3\frac{1}{3}$
——— of third ventral ray	2	$6\frac{1}{2}$

4. Holocentrum pœcilopterum.

Bleeker, Kokos-Eilanden, p. 356.

D. 11 | $\frac{1}{13}$. A. $\frac{4}{9}$. L. lat. 52.

The height of the body is $3\frac{3}{4}$ in the total length, the length of the head $3\frac{1}{2}$–$3\frac{2}{3}$. Operculum with two strong spines, the lower of which is smallest. The upper maxillary bone reaches to behind the middle of the eye. The fourth and fifth dorsal spines longest; the soft dorsal fin is less than half as high as the body; the length of the caudal is $5\frac{1}{2}$ in the total, the upper lobe is longer; the third anal spine very thick, and nearly twice as long as the longest of the dorsal fin; ventral fins not very much longer than the pectorals. Red, with lighter longitudinal bands; the first dorsal yellow, with two longitudinal series of large round rose-coloured spots. (*Bl.*)

Sea of Cocos Island.

5. Holocentrum erythræum. (Plate V.)

D. 11 | 15. A. $\frac{4}{10}$. L. lat. 48. L. transv. 3/6.

The height of the body is nearly equal to the length of the head, and $3\frac{1}{3}$ in the total; the interspace between the eyes is $5\frac{1}{2}$ in the length of the head. The upper maxillary bone reaches to below the middle of the eye; jaws equal in front; the groove for the processes of the intermaxillaries is slightly longer than the diameter of the eye; turbinal bone terminating in a bony anterior process, slightly forked, but not covering the intermaxillary. The third to sixth dorsal spines longest, one-third of the height of body; both lobes of the caudal equal, and one-fifth of the total length. The third anal spine is not very much longer than the fourth, not twice as long as the longest of the dorsal, and $5\frac{3}{4}$ in the total length. Ventral fins scarcely longer than the pectorals. Red, with lighter longitudinal bands; the spinous dorsal with a longitudinal series of round white spots, always one between two spines.

Sea of S. Christoval.

a. Adult. From the Collection of the Zoological Society.
b. Adult: stuffed. S. Christoval. Voyage of the Herald.

Description.—This species appears to be near *Holoc. pœcilopterum*, from which, however, it differs in several respects, as is evident from the diagnosis given above; from *Hol. tiere* it may be distinguished by eleven dorsal spines, and from *H. tieroides* by a greater number of scales in the lateral line. It belongs to the species with high body and compressed head. The snout is rather pointed, and equal to the diameter of the eye; the vomerine teeth stand in an obtuse-angled triangle, with a rather concave posterior edge. The anterior infraorbital bone has a rather strong tooth in front of the supplementary bone of the maxillary, and another rather smaller one beneath the anterior half of the orbit; between them are five or seven small ones; the remainder of the infraorbital arch is finely serrated. The number of the radiating ridges on the occiput varies on both sides from seven to nine. All the opercles are very strongly striated over all their surface, and deeply denticulated behind; so also the scapulary bone. The size of the opercular spines varies: there are—

In specimen *a*. on the right side, two strong spines, the upper rather longer.

In specimen *a*. on the left side, two spines, the lower indistinct.

In specimen *b*. on the right side, two strong spines, the upper rather longer.

In specimen *b*. on the left side, two equal strong spines.

The præopercular spine has two deep grooves, and is one-half of the length of the posterior margin of præoperculum; suboperculum serrated along its whole length, interoperculum entire in its anterior half.

The spinous dorsal is very low, its longest spine being one-third only of the height of the body; the last spine is two-thirds of the first. The longest ray of the soft dorsal is the third, being longer than one-half of that height. The soft dorsal begins on a level with the twenty-eighth scale of the lateral line. The caudal fin has, as usual, some spinous rays on the upper and lower side of the root; the lobes are equal to one-fifth of the total length, and pointed. The anal commences opposite the soft dorsal; the first spine is minute; the second very small, shorter than the shortest of the dorsal; the third longest, but shorter than the longest ray of the anal, and contained $5\frac{3}{4}$ in the total length; the fourth spine slender, twice as long as the first of the dorsal fin; the first ray is the longest, one-fifth of the total length, and more than four times as long as the last. The pectoral fins reach to the level of the nineteenth scale of the lateral line, the ventrals to that of the twenty-second.

The scales are not striated, but finely serrated at the posterior margin; one of the largest covers one-third of the eye, and is two-thirds as long as high.

The coloration appears to be red, with bands of a lighter tinge along each series of scales. No other markings are visible, except the round whitish spots, forming a series along the middle of the spinous dorsal; there is another triangular spot behind the tip of each spine. In life the round spots may have been blue, and the triangular ones rose-coloured.

	inches.	lines.
Total length	8	$2\frac{1}{2}$
Height of the body	2	5
Length of the head	2	$5\frac{1}{2}$
Interspace between the eyes	0	5
Diameter of eye	0	8
Præopercular spine	0	$5\frac{1}{2}$
Length of fourth dorsal spine	0	9
——— of third dorsal ray	1	$4\frac{1}{2}$
——— of third anal spine	1	4
——— of first anal ray	1	$5\frac{2}{3}$
——— of a large scale	0	3
Height of a large scale	0	5

6. **Holocentrum microstoma.** (Plate VI. fig. A.)

D. 11–12 | 13. A. $\frac{4}{9}$. L. lat. 47–53. L. transv. 4/7.

The height of the body is nearly four times in the total length, the length of the head $3\frac{2}{3}$; the interspace between the eyes is $4\frac{3}{5}$ in the latter. Lower jaw rather prominent; snout rather pointed, shorter than the diameter of eye; the upper maxillary reaching to below the anterior third of the eye. Operculum with two prominent spines, the upper of which is the longer. Præopercular spine small, not much stronger than that of operculum. The fourth, fifth and sixth dorsal spines longest, one-half of the height of body; lobes of the caudal equal; the third anal spine much longer and stronger than the fourth, one-fifth of the total length; pectorals shorter than ventrals. Red, with lighter longitudinal bands; a small brownish speck behind the first dorsal spine.

a. Adult. Amboyna. From Mr. Frank's Collection.
b. Half-grown. Old Collection.

Description.—The form of the body is rather elongate, the snout of moderate length, four-fifths of the diameter of eye (difference from *H. laticeps*). The interspace between the eyes is nearly equally broad behind and in front, but with a slight concavity above the middle of the eye. The two bony ridges are distant from one another and parallel; the groove for the processes of the intermaxillary bones goes not very far behind, its length being the same as that of the snout. The turbinal bone terminates in front in an obtuse point, scarcely covering the intermaxillary. The mouth is smaller than in most of the other species, the upper maxillary reaching to below the anterior third of the eye only. The diameter of the eye forms nearly one-third of the length of the head (opercular spine always included).

All the opercles are striated and denticulated, as the scapular and humeral bones. The præoperculum has a short spine, rather longer than one-third of the posterior margin of this bone; the margin is vertical.

The dorsal spines are moderately thick; the spinous and soft dorsal fins are equal in height, one-half of the depth of the body. The lobes of the caudal are equal, pointed, and $5\frac{2}{3}$ in the total length. The first spine of the anal fin is minute; the second shorter than the shortest of the dorsal; the third longest, even longer than the rays, one-fifth of the total length; the fourth is strong, about the length of the second of the dorsal, and may be entirely hidden in a groove of the third. The pectorals are rather short, one-sixth of the total length, and reach to the sixteenth scale of the lateral line. The spine of the ventrals is one-third of their own length, rather slender; the length of the longest ray is nearly one-fifth of the total, and the fin reaches to the level of the twenty-second scale of the lateral line.

The scales are not striated, but finely serrated at the posterior margin; one of the largest not covering even one-fourth of the eye.

Red, with violet tinge on the back, and silvery on the belly; lighter bands along each series of scales. The fins are now uniform yellowish white; an indistinct brownish speck is still visible between the first two dorsal spines.

	inches.	lines.
Total length	6	8
Height of the body	1	9
Length of the head	1	11
Interspace between the eyes	0	5
Length of the snout	0	5
——— of præopercular spine	0	3
——— of fifth dorsal spine	0	11
——— of third dorsal ray	0	$11\frac{1}{3}$
——— of third anal spine	1	$4\frac{1}{2}$
——— of fourth anal spine	0	8
——— of first anal ray	1	0
——— of a large scale	0	$2\frac{1}{3}$
Height of a large scale	0	$8\frac{1}{2}$

7. Holocentrum rubrum.

Seba, iii. 27. 1.
Sciæna rubra, *Forsk.* p. 48 (not *Bl. Schn.*).
Renard, Poiss. t. 29. f. 159; *Valentyn, Ind.* iii. p. 390. f. 137.

Perca rubra, *Bl. Schn.* p. 90.
—— praslin, *Lacép.* iv. p. 418.
Holocentrum alborubrum, *Lacép.* iv. p. 372; *Richardson, Ichth. China,* p. 223.
—— orientale, *Cuv. & Val.* iii. p. 197, vii. p. 497; *Bleeker, Perc.* p. 53.
Holocentrus ruber, *Rüpp. Atl.* p. 83. t. 22. f. 1, and *N. W. Fische,* p. 96.
Holocentrum marginatum, *Cuv. & Val.* iii. p. 216.
—— spinosissimum, *Richardson, l. c.* p. 223 (not *Fauna Japon.*)

D. 11 | 12–13. A. $\frac{4}{9}$. L. lat. 35–37. L. transv. 3/6.
Cæc. pylor. 20. Vert. 11/16.

The height of the body is equal to the length of the head (opercular spine included) and $3\frac{1}{2}$ in the total; the interspace between the eyes is one-fifth of the length of the head. The groove for the processes of the intermaxillary much shorter than the diameter of eye. Operculum with two strong prominent spines, the lower of which is the smaller. The third, fourth and fifth dorsal spines longest; the soft dorsal fin rather higher than the spinous. The length of the caudal is $4\frac{2}{3}$ in the total, both the lobes being equal in length. The third anal spine very long and strong; its length is $4\frac{1}{3}$ 5 times in the total. The ventral fins reach near to the anus, and are rather longer than the pectorals. Scales scarcely striated. Red, with eight whitish longitudinal bands; the outer edges of the caudal blackish; the ventrals whitish, black between the third spine and the first ray.

Red Sea; Indian Archipelago; Chinese and Japanese Seas.

a. Half-grown: stuffed. Red Sea. From the Frankfort Museum.
b. Adult. Amboyna. From Mr. Frank's Collection.
c. Adult: skeleton. Amboyna. From Mr. Frank's Collection.
d, e. Adult: stuffed. Louisiade Archipelago. Voyage of the Rattlesnake.
f, g. Adult: stuffed. Louisiade Archipelago. Presented by the Lords of the Admiralty.
h. Half-grown. Philippines.
i. Adult: not good state. Japan.
k. Adult. China.
l. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
m. Adult. India.

The specimens in which Sir J. Richardson thought he recognized *H. alborubrum*, Lacep., and *H. spinosissimum*, Temm. et Schleg. decidedly belong to the above species: he mentions specimen *l*. as having seven rays in the anal fin; but I can distinctly see nine, as usual in the species of *Holocentrum*. The specimen from the Red Sea differs from the East Indian ones in having the third anal spine longer; in the former it is contained $4\frac{1}{3}$ in the total length, whilst it is one-fifth only in specimens collected in the seas of Japan, Amboyna, and in the Louisiade Archipelago.

Skeleton.—The upper surface of the *skull* is flat, without deep grooves or high ridges. The supraoccipital crest is limited to the posterior part of the occiput, without extending on its upper surface. There are two parallel bony ridges running along the middle of the interspace between the eyes; there is no distinct cavity between them, nor on any other part of the skull, except the groove for the posterior processes of the intermaxillaries; this groove is narrow, elongate, nearly equally broad anteriorly and posteriorly, and extends between the principal frontals to the level of the anterior fourth of the orbit. These bony ridges radiate behind in ten or more branches, fan-like arranged; the hinder part of the upper roof of the orbit is covered with spines, directed backwards.

The *maxillary* bone is styliform in its inner half, then gradually widens into a moderately broad plate, with a straight anterior edge, and the posterior rather concave; the supplementary bone is very narrow, tapering above. The intermaxillaries are separated from one another by a small notch; they are nearly as long as the maxillaries, and have a slight prominence behind. The mandibulary without protuberance in front.

The *dentition* is formed by villiform bands only, without any canines or granular prominences. The bands on the jaws reach to the extremity of the bones; the vomerine teeth are arranged in two narrow bands, meeting under an obtuse angle; the palatine teeth form a narrow band extending on the pterygoid. The teeth of the pharyngobranchials are placed in several round patches, one of which is larger and ovate.

The *infraorbital* arch is rather narrow, and nearly equally broad, the præorbital being not much widened; its ossification is complete, and there is no outer membrane. The lower edge only is serrated; the præorbital strongly armed with spinous teeth, directed backwards; the anterior and posterior ones are strongest. The turbinal bone overreaches the intermaxillary with a short point. The infraorbital arch has inside a broad concave plate, forming nearly a half-circle, and supporting the eye-ball, together with the *entopterygoid*, which is very broad, and attached to the basisphenoid by a narrow ligament only.

All the *opercles* are distinctly serrated and striated as far as they are not covered by scales. The operculum is one and a half as high as wide (the pine included); on its upper third it has two flat ridges, divergent and terminating in two flat spines, the upper of which is long and strong; the serrature is rather coarse, and formed by small spinous teeth, the terminations of the striæ. The suboperculum is elongate, crescent-shaped, its denticulations scarcer and coarser than those of the operculum; the edge before the pectoral is entire. The interoperculum has posteriorly a notch at the place where the præopercular spine passes; the denticulations are very coarse and directed backwards. The præoperculum has a simple ridge only, with regular serrature on both the edges; they meet nearly at a right angle. The præopercular spine runs in the same line with the lower edge, and its length is 2½ in that of the posterior edge.

The *vestibular* opening is elongate or irregularly ovate: I could not find any bony plate in connexion with the tympanum, as is found in *Myripristis adustus*.

The suprascapular and coracoid are distinctly denticulated; the other *humeral* bones show no remarkable peculiarity. The urohyal resembles that of *Myripristis*, but is not so high, and more arrow-shaped. The *pubic* bones are very much like those of *Myripristis*, but rather more elongate.

There are eleven abdominal and sixteen caudal *vertebræ*, the length of the abdominal part of the vertebral column being $1\frac{2}{5}$ in that of the caudal. The hæmal spines are stronger than the neural. Nine ribs; the first to fifth ribs have epipleural spines; but such appendages belonging to the posterior ribs are inserted on the vertebræ themselves. The ribs of the eleventh vertebra are very broad, sword-shaped, and separated from one another. The strongest interhæmal is apparently formed by two, belonging to the second and third dermohæmals; a high bony ridge arises from the joint of each of these dermohæmals, and both ridges are attached to one another by a transparent plate. The length of this interhæmal equals that of the first nine vertebræ.

8. Holocentrum laticeps.

Cuv. & Val. iii. p. 211, vii. p. 500.

D. 11 | 13. A. $\frac{4}{9}$. L. lat. 42. L. transv. 3/7.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $3\frac{2}{3}$; the interspace between the eyes is one-fourth of the latter; the length of the snout is less than the radius of the eye; the upper maxillary does not reach to below the middle of the eye; opercular spines equal, or the lower longer than the upper; the præopercular spine short, about one-third of the length of the posterior margin of præoperculum. The fourth and fifth dorsal spines longest, about one-half the height of body; the upper lobe of the caudal rather longer than the lower. The third anal spine longer and stronger than the fourth, and $5\frac{2}{3}$ in the total length; pectoral and ventral fins equal in length. Golden shining (in spirits), scales minutely dotted with black; the upper half with seven brown longitudinal bands; an oblique black streak between each pair of the dorsal spines, reaching from the tip of one spine to the base of the preceding; the other fins not coloured.

Sea of Batavia.

a. Adult female. From the Collection of the Zoological Society
b. Half-grown. From the Haslar Collection.

9. Holocentrum punctatissimum.

Holocentrum punctatissimum, *Cuv. & Val.* iii. p. 215; *Less. & Garn. Voy. Coq. Zool.* ii. p. 219; *Bleeker, Sumatra*, ii. p. 6.
? —— lacteoguttatum, *Cuv. & Val.* iii. p. 214.

D. 11 | 12-13. A. $\frac{4}{9-10}$. L. lat. 42.

The height of the body is contained four times in the total length, the length of the head $3\frac{2}{3}$. The upper maxillary reaches to below the middle of the eye; operculum with two spines, the upper of which is the longer. Snout shorter than the half-diameter of the eye. The third and fourth dorsal spines longest, more than half as high as the body, and shorter than the soft dorsal. The upper lobe of the caudal is longer, and $5\frac{1}{4}$ in the total length; the third anal spine very strong, and one-fifth of the total. Rose-coloured, with scattered purplish dots; the first dorsal black-edged, and with a series of deep blue spots.

H. lacteoguttatum is considered as a variety of *H. punctatissimum*, and is distinguished by a double series of spots on the dorsal fin.

Sumatra; Caroline Islands.

10. Holocentrum stercus muscarum.

Cuv. & Val. vii. p. 503.

D. 11 | 11. A. $\frac{1}{8}$.

The third spine of the anal fin is shorter than one-fifth of the total length. Dorsal fin immaculate, the spinous part with a whitish edge; on the præoperculum and on each side a longitudinal series of black dots. (*Val.*)

Sea of Guam.

11. Holocentrum hastatum.

Duhamel, Pêches, ii. pl. 5. f. 2.

Holocentrum hastatum, *Cuv. & Val.* iii. p. 208, vii. p. 499. pl. 59.

D. 11 | 14. A. $\frac{4}{9}$. L. lat. 44. Cæc. pylor. 16.

The height of the body is $3\frac{1}{3}$ in the total. Operculum with a strong spine, of about the size of that of the præoperculum; sometimes one or two smaller ones beneath. The fourth and fifth dorsal spines longest, not shorter than the rays; the length of the caudal fin is about one-fifth of the total; the lobes are equal. The third anal spine very long, one-fifth of the total length. Red, with longitudinal bands; a large black spot between the first three dorsal spines, and a smaller one between the last three rays.

West African Coast.

a. Young: dried: not good state. Sine patria From Mr. Yarrell's Collection.

12. Holocentrum spiniferum.

Sciæna spinifera, *Forsk.* p. 49.

Perca spinifera, *Bl. Schn.* p. 86; *Lacép.* iv. p. 418.

Holocentrum leo, *Cuv. & Val.* iii. p. 204; *Less. Voy. Coq.* ii. p. 222; *Cuv. Règne Anim. Ill.* pl. 14. f. 1; *Bleeker, Kokos Islands*, p. 355; *Voy. Astrol. Poiss.* p. 678. pl. 14. f. 3.

Holocentrus spinifer, *Rüpp. N. W. Fische*, pp. 96, 97. t. 25. f. 1 (not *Atlas*).

D. 11 | 15. A. $\frac{4}{10}$. L. lat. 44–45. L. transv. 4/8.
Cæc. pylor. 16. Vert. 10/15.

The height of the body is equal to the length of the head, and $3\frac{1}{2}$

in the total; the interspace between the eyes is one-ninth of the length of the head. Præopercular spine more than half as long as the posterior edge of præoperculum. The second, third, and fourth dorsal spines are longest, of about the same length as the third anal one; the soft dorsal fin is rather lower than the spinous. The length of the caudal is $5\frac{1}{2}$ in the total, both the lobes are equal. The third anal spine is very much longer and stronger than the fourth, its length is $7\frac{1}{2}$ in the total. Posterior edge of præoperculum very oblique. Rose-coloured, with a deep red spot behind the eye, and another above the roof of the pectoral; the spinous dorsal deep red; the other fins yellow.

Red Sea; Eastern coast of Africa through the Indian Ocean to the Pacific.

a. Adult: stuffed. Red Sea.
b. Large specimen: stuffed. Isle de France. From Dr. Janvier's Collection.
c. Large specimen: stuffed. Louisiade Archipelago. Voyage of the Rattlesnake.
d, *e*. Half-grown: stuffed. Louisiade Archipelago. Voyage of the Rattlesnake.
f. Large specimen: stuffed. Sine patria.
g. Half-grown: stuffed. Sine patria.

H. spiniferum, from the Red Sea, appears to be at least a variety of *H. leo*, from the East-Indies. Neither in the descriptions, nor in the figures given of the latter, are the deep red colour of the spinous dorsal, and the spots behind the eye mentioned. Moreover, the dorsal spines of the East Indian specimens are rather thicker, but equally long. Dried specimens are entirely similar in other respects.

13. Holocentrum binotatum.

Quoy & Gaim. Voy. Astrol. Poiss. p. 679. pl. 14. f. 4 (not *Bleek.*).

D. 11 | 13. A. $\frac{4}{9}$. L. lat. 34. L. transv. 3/6.

The height of the body is equal to the length of the head and $3\frac{1}{3}$ in the total; the interspace between the eyes is $4\frac{3}{4}$ in the length of the head; both the jaws equal in front; snout shorter than the diameter of eye, pointed; the groove for the process of the intermaxillary bones rather longer than the diameter of eye; the turbinal bone terminates in front in a process, covering the intermaxillary. The upper maxillary reaches to below the middle of the eye. Opercles striated, deeply serrated; the upper opercular spine longest; the spine of præoperculum rather longer than one-half of the posterior edge of that bone. The third and fourth dorsal spines longest, rather more than one-half of the height of body; lobes of the caudal equal in length; the third anal spine much longer and stronger than the fourth, one-fifth of the total length. Red, with lighter longitudinal bands; pectorals yellowish.

Sea of New Guinea and Guam.

a. Adult. Old Collection.

Holocentrum binotatum, Bleek. Goram, p. 207, is not only different from our specimen, but also from that of Quoy and Gaimard. His fish appears to be more elongated having also forty-three scales in the lateral line; it has moreover a black blotch on the dorsal fin, which certainly would not have been overlooked by the French naturalists.

14. Holocentrum caudimaculatum.

Holocentrum spiniferum, *Cuv. & Val.* iii. p. 206, vii. p. 498; *Rüpp. Atlas*, p. 86. taf. 23. f. 1 (not *N. W.*).
? Holocentrus ruber, *Bennett, Fishes of Ceylon*, pl. 4.
Holocentrus caudimaculatus, *Rüpp. N. W. Fische*, p. 97.

D. 11 | 14. A. $\frac{4}{10}$.

The height of the body is equal to the length of the head, and $3\frac{1}{3}$ in the total. The soft dorsal fin is rather higher than the spinous; the length of the caudal is $6\frac{1}{2}$ in the total, both the lobes are equal; the third anal spine is much longer and stronger than the fourth, its length is $4\frac{1}{2}$ in the total. Posterior edge of præoperculum vertical; operculum with two prominent spines, the lower of which is smaller; edge of suboperculum entire; the upper outline of head straight. Uniform red; a white spot on the back of tail (in life).

Red Sea; Ceylon?

15. Holocentrum tiereoides.

Bleeker, Amboina, iv. p. 334.

D. 11 | 12–13. A. $\frac{4}{9-10}$. L. lat. 40.

The height of the body is equal to the length of the head, and $3\frac{3}{4}$ in the total. Jaws equal in front, the upper maxillary reaching to below the middle of the eye. The præopercular spine longer than one-half of the diameter of the eye; two unequal opercular spines; scapulary not serrated; the fourth, fifth, and sixth dorsal spines longest. Red. (*Bl.*)

Sea of Amboyna.

16. Holocentrum spinosissimum.

Temm. & Schleg. Faun. Japon. p. 22. pl. viii. A. (*Richardson, Ichthyol. China*, p. 223, belongs to H. rubrum.)

D. 11 | 14. A. $\frac{4}{9}$. L. lat. 36. L. transv. 3/7.

Scales exceedingly deeply striated and serrated. The height of the body is $3\frac{1}{4}$ in the total length, the length of the head $3\frac{1}{3}$; snout much shorter than the eye. Operculum with a strong striated spine; one or two smaller ones beneath. Præopercular spine long, with a very prominent longitudinal ridge. The third anal spine is exceedingly thick, and its length is about one-fifth of the total. The caudal lobes equal. Red; each series of scales with a lighter longitudinal band.

Sea of Japan.

17. Holocentrum diadema.

Holocentrus diadema, *Lacép.* iv. pp. 372, 374, iii. pl. 32. f. 3; *Rüpp. Atl. Fische*, p. 84. t. 22. f. 2.

Perca pulchella, *Benn. Zool. Journ.* iii. p. 377. pl. 9. f. 3.

Holocentrum diadema, *Cuv. & Val.* iii. p. 213; *Less. Voy. Duperr. Zool.* ii. p. 220. pl. 25. f. 2; *Bleeker, Amboina & Ceram*, p. 259.

D. 11 | $\frac{1}{13}$. A. $\frac{4}{9}$. L. lat. 48. L. transv. 3/7. Vert. 11/16.

The height of the body is $3\frac{3}{5}$ in the total length, the length of the head four times; the interspace between the eyes is one-fifth of the latter. Operculum with two prominent spines, the upper of which is the stronger, nearly equal in size to that of the præoperculum. The fourth, fifth, and sixth dorsal spines longest, as high as the longest ray, but shorter than the anal spine. The length of the caudal is one-sixth of the total, both the lobes being equal. The third anal spine is exceedingly strong, and about one-fifth of the total length. The ventral fins reach near to the anus, but the pectorals are much shorter. Red, with eight to eleven silvery longitudinal bands; the spinous dorsal black, with a white longitudinal band; the other fins rose-coloured.

Red Sea; Madagascar; Ceylon; Chinese Sea; Indian Archipelago.

a. Adult. Borneo.
b. Half-grown. China Seas. Presented by Capt. Sir Edward Belcher.
c. Half-grown. Tonga Islands. From the Haslar Collection.
d. Half-grown. Feejee Islands. Voyage of the Herald.
e. Half-grown: very bad skin. Ceylon. From the Collection of the Zoological Society.
f. Adult. Madagascar. Presented by Dr. J. E. Gray.
g. Adult: skeleton. India. From Mr. Frank's Collection.
h, *i*. Adult. India. From Mr. Frank's Collection.

Skeleton.—The general structure of the skeleton being the same as in *Holocentrum rubrum*, I give a detailed description of those parts only which exhibit specific peculiarities.

The fan-like expansion on the vertex is formed by ten or more radiating branches; the groove for the posterior processes of the intermaxillaries reaches a little beyond the level of the anterior margin of the orbit. The maxillary and mandibulary bones as in *H. violaceum*. The intermaxillaries are not separated from one another by a notch; they are three-quarters of the length of the maxillaries, and have a prominent flat protuberance posteriorly.

The *dentition* is formed by villiform bands only; those on the jaws reach to the posterior extremity of the bones; they are broad in front and tapering behind, the intermaxillary band less than that of the mandibulary. The vomerine teeth are placed in a small, triangular, equilateral patch, those of the palatine bones in a narrow band, extending on the pterygoid. The teeth of the pharyngobranchials form two broad patches on each side, with a few smaller ones besides; the hypobranchials are separated from one another, elongate, triangular, and entirely covered with villiform teeth.

The *præorbital* is scarcely widened in front, but armed with a strong, thick, and striated spinous tooth; several small ones follow posteriorly, but they are scarcely larger than the remainder of the serrature of the infraorbital arch. The anterior end of the *turbinal* bone is broad and obtuse.

The serrature of all the *opercles* is very distinct and complete; even the scales, covering in a single series the base of the operculum, are similarly striated and serrated; likewise the suprascapula and the coracoid. But the præopercular spine is rather short, not much larger than that of the operculum, its length being $2\frac{1}{2}$ in that of the posterior edge of the præoperculum.

The *vestibular opening* is elongate, ovate, of moderate size.

The *urohyal* as in *H. violaceum.*

The length of the abdominal part of the *vertebral* column is $1\frac{1}{5}$ in that of the caudal. The hæmal and neural spines are of equal strength. The length of the strongest interhæmal equals that of the first seven vertebræ.

18. **Holocentrum melanotopterum.**

Bleeker, Celebes, viii. p. 302.

D. 11 $\big|\,\frac{1}{14\text{–}15}$. A. $\frac{4}{9\text{–}10}$. L. lat. 43.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $3\frac{2}{3}$–$3\frac{3}{5}$. The upper maxillary bone reaches to below the middle of the eye. Operculum with two strong spines, the upper of which is rather longer. The second, third, and fourth dorsal spines longest, but not half as high as the body, and shorter than the longest ray; the lobes of the caudal equal, and $5\frac{1}{2}$ in the total length; the third anal spine nearly equal to the longest dorsal spine. Red; the first dorsal black, with rose-coloured spots between the middle spines. (*Bl.*)

Sea of Celebes.

19. **Holocentrum violaceum.**

Bleeker, Amboina, iv. p. 335.

D. 11 | 14. A. $\frac{4}{9}$. L. lat. 36–37. L. transv. 3/6. Vert. 11/16.

The height of the body is $3\frac{1}{6}$ in the total length, the length of the head $3\frac{3}{5}$; the distance between the eyes is $5\frac{1}{2}$ in the latter; the length of the snout is not much less than the diameter of the eye; jaws nearly equal in front; the turbinal bone with a bifid process, covering the intermaxillary. Operculum with two flat spines, distant from one another, the lower of which is the smaller; præoperculum with the posterior edge vertical; the third, fourth, and fifth dorsal spines longest, shorter than the præopercular edge mentioned; caudal lobes equal; the third anal spine strong, but one-sixth of the total length only; ventral and pectoral fins nearly equal in length. Violet; each scale with a rose-coloured transverse streak; snout and fins red; the spinous dorsal violet, with rose-coloured streaks.

Amboyna.

a. Adult. Amboyna. From Mr. Frank's Collection.
b. Half-grown. Amboyna. From Mr. Frank's Collection.
c. Adult: skeleton. Amboyna. From Mr. Frank's Collection.
d. Adult. Amboyna. From Mr. Stevens's Collection.

Skeleton.—The general structure of the skull is very similar to that of *H. rubrum*, but with such modifications as to indicate the specific difference as well as the external characters do. The narrow interspace between the eyes is still more conspicuous in the skeleton. The groove for the posterior processes of the intermaxillary bones is very like that of *H. rubrum*, and extends between the principal frontals, but scarcely beyond the level of the anterior margin of the orbit. The fan-like expansion on the vertex is formed by seven or eight radiating branches.

The *maxillary* bone is styliform at its origin only, and soon becomes broader, forming a triangular plate with the posterior edge rather concave and the anterior convex: the supplementary bone is unusually developed, forming nearly one-half of the outer part of the maxillary; it is crescent-shaped, with a small *os intercalare* at its upper extremity; it is roughened by streaks, the maxillary itself being smooth. The intermaxillaries are separated from one another by a small notch; they are $\frac{3}{4}$ as long as the maxillaries, and have posteriorly, in the middle of their length, a very prominent flat protuberance. The mandibularies show a slight swelling in front, corresponding with an accumulation of the villiform teeth.

The *dentition* is formed by villiform bands only, without any canines or granular prominences. The bands on the jaws reach to the posterior extremity of the bones; but, whilst those of the intermaxillaries are nearly equally broad in their whole length, those of the mandibularies are broadest in front and tapering behind. The vomerine teeth are arranged in two narrow and short bands, meeting at a right angle; the palatine teeth form a narrow band, extending far on the pterygoid bone. The teeth of the pharyngobranchials form two broad patches on each side, with several smaller ones besides.

The *infraorbital* arch is rather narrow and nearly equally broad, the præorbital widening anteriorly; its ossification is complete; but there may be seen traces of a very narrow channel, covered on the outside with streaks of a thin membrane,—a structure much more developed in other genera of this family and in many other fishes. The lower edge of the arch is serrated. The præorbital is strongly armed with eight or nine spinous teeth, directed backwards, the anterior and posterior of which are very strong. The turbinal bone overreaches the intermaxillary, with a prominent and bifurcate spine. The posterior part of the hinder opening of the nostril has two very small spines, reaching into the cavity; they may be easily lost by a less careful preparation of the skull. The inner parts of the orbital cavity are formed as in *H. rubrum*.

The description given of the *opercles* of *H. rubrum* may be applied also to this species; but the serrature and the spines are rather stronger; the suboperculum moreover is indistinctly denticulated above the præopercular spine only; this spine is very long, its length being $1\frac{1}{2}$ in that of the posterior edge of the præoperculum.

The *vestibular* opening is small, only twice as large as the posterior nostril: if there is a bony plate in connexion with the tympanum (cfr. *Myripristis adustus*, p. 23), it must be exceedingly thin and small.

The suprascapula is distinctly serrated, but neither the humeral nor the coracoid. The urohyal is irregularly three-sided, with one anterior and two posterior angles; the lower and upper sides are convex, the hinder concave; the lower angle of the two posterior ones reaches further behind than the upper. The pubic bones as in *H. rubrum*.

There are eleven abdominal and sixteen caudal *vertebræ*, the length of the abdominal part of the vertebral column being $1\frac{1}{3}$ in that of the caudal. The hæmal spines are not stronger than the neural. Nine ribs; the first to seventh ribs have epipleural spines, and similar appendages are inserted on the anterior and posterior vertebræ. The form of the ribs of the eleventh vertebra and that of the first interhæmal spine is similar to those of *H. rubrum*, but the length of the latter equals that of the first eight vertebræ only.

20. Holocentrum cornutum.

Bleeker, Ceram, iii. p. 240.

D. $12 \mid \frac{1}{12-13}$. A. $\frac{4}{9-10}$. L. lat. 36.

The height of the body is equal to the length of the head, and $3\frac{2}{3}$–$3\frac{3}{4}$ in the total. A spine directed outwards, in the inferior and anterior angle of the orbit. The maxillary bone does not reach to the middle of the eye; the præopercular spine not much shorter than the diameter of the eye; the upper opercular spine longest; scapular bone much serrated. The third to sixth dorsal spine longest, and nearly equal to the soft dorsal; the third anal spine much longer. Rose-coloured, with nine darker longitudinal bands, one of them terminating in a black caudal spot; the membrane of the spinous dorsal black, with red spots; the other fins red · the anal fin between the third spine and first ray, and the caudal on the outer edges, dark violet. (*Bl.*)

Rivers of Ceram; Sea of Amboyna.

21. Holocentrum tiere.

Cuv. & Val. iii. p. 202; *Voy. Coq.* ii. p. 221, *Poiss.* pl. 25. f. 1 (not good).

D. $12 \mid 14$. A. $\frac{4}{9}$.

Operculum with two prominent spines, equal in length; the spinous dorsal low; none of the other vertical fins elongate; lobes of the caudal equal in length. Uniform red.

Sea of Otaheiti.

22. Holocentrum sammara.

Sciæna sammara, *Forskal*, p. 48; *Lacép.* iv. p. 314.
Perca sammara, *Bl. Schn.* p. 89.
Labrus angulosus, *Lacép.* iii. p. 430. pl. 22. f. 1.
Holocentrum sammara, *Rüpp. Atl. Fische*, t. 22. f. 3; *Cuv. & Val.* iii. p. 216; *Bleeker, Perc.* p. 54, and *Amboina*, ii. p. 555.
Holocentrum christianum (*Ehrenberg*); *Cuv. & Val.* iii. p. 219: cfr. *Rüpp. Atl.* p. 85.

D. $10 \left| \frac{1}{11-12} \right.$. A. $\frac{4}{7-8}$. L. lat. 40. L. transv. 4/7. Vert. 11/16.

The height of the body is four times in the total length, the length of the head $3\frac{1}{4}$; the distance between the eyes is $4\frac{1}{3}$ in the latter; the length of the snout is nearly equal to the diameter of the eye. The upper processes of the intermaxillaries reach far between the eyes; turbinal bone not covering the intermaxillary; lower jaw very prominent. Operculum with two distinct spines, the lower of which is rather the smaller. Lobes of the caudal equal. The third anal spine is $4\frac{2}{3}$ in the total length. The spinous dorsal with a deep black blotch between the first and fourth spines, and with two series of white spots, one along the upper margin, and the other along the base.

Red Sea; Cape of Good Hope; Amboyna; Sumbawa.

a. Adult. Amboyna. From Mr. Frank's Collection.
b. Adult. Amboyna. From Mr. Stevens's Collection.
c, *d*. Adult: stuffed. Red Sea. From the Frankfort Museum.
e. Adult: stuffed: not good state. Cape Seas. Presented by Sir A. Smith.
f, *g*. Half-grown. India. Presented by the Zoological Society.
h, *i*. Adult: skeletons. India Presented by the Zoological Society.
k. Adult. India.
l. Adult. India. From the Haslar Collection.

Skeleton.—The general structure of the skeleton being the same as in the preceding species, I give a detailed description of those parts only which exhibit specific peculiarities. The fan-like expansion on the vertex is formed by nine or more radiating branches. The orbital edge of the frontals is concave, these bones forming a slight prominence above the anterior part of the eye. The groove for the posterior processes of the intermaxillaries reaches far behind, nearly to the level of the second third of the eye. The maxillary bone is styliform at its origin only, and then forms an oblong plate with an irregularly convex anterior margin, and with the posterior rather concave. The supplementary bone is composed of two pieces, the posterior of which is larger and slightly denticulated in front. The intermaxillaries are separated from one another by a deep notch; they are three-quarters of the length of the maxillary bones, and have a very prominent and flat protuberance behind. The mandibularies are distinguished by their length, considerably overreaching the upper jaw.

The bands of villiform *teeth* of the jaws reach to their posterior extremity, and are tapering behind. The vomerine teeth are placed in a small triangular patch, broader than long. The pterygoid bones as well as the palatines are furnished with narrow bands.

The *præorbital* is somewhat widened anteriorly and armed with a rather strong tooth, the posterior denticulations differing little in size from one another. The turbinal bone is obtuse and scarcely prominent. The posterior nostril has no spinous teeth.

The *opercles* are feebly striated and armed; the denticulations of the suboperculum are even indistinct; the præopercular spine is flat, triangular, and one-third only of the length of the posterior margin of the præoperculum. Suprascapula distinctly, coracoid indistinctly serrated.

The *vestibular* opening is elongate, but equals in size the posterior opening of the nostril.

The length of the abdominal part of the *vertebral* column is $1\frac{1}{3}$ in that of the caudal. The hæmal spines are rather stronger than the neural. The length of the strongest interhæmal equals that of the first seven vertebræ.

23. Holocentrum operculare.

Cuv. & Val. vii. p. 501; *Bleeker, Banda,* i. p. 233; *Voy. Astrol. Poiss.* p. 676. pl. 14. f. 1.

D. $10 \mid \frac{1}{12\text{–}13}$. A. $\frac{4}{9\text{–}10}$. L. lat. 38.

The height of the body is one-fourth of the total length, the length of the head rather more than one-third. The upper maxillary does not reach to the middle of the eye; operculum with two spines, the upper of which is the longer. The third, fourth, and fifth dorsal spines longest. The lobes of the caudal are equal, and $5\frac{2}{3}$ in the total length; the third anal spine is $5\frac{1}{2}$ in the same length. Red: each scale on the head and back with a violet margin; operculum brownish; the first dorsal black, along the base and the upper edge white; the other fins rose-coloured.

Sea of New Ireland; Banda.

24. Holocentrum læve. (Plate VI. fig. B.)

D. $10 \mid \frac{1}{11}$. A. $\frac{4}{7}$. L. lat. 40. L. transv. 4/7.

Body rather elongate; the interspace between the eyes is one-fourth of the length of head; the lower jaw rather prominent, snout not much shorter than the diameter of eye; opercular spines nearly equal; sub- and inter-operculum entire, or scarcely denticulated; dorsal spines slender, the second, third and fourth longest; caudal lobes equal, pointed; the third anal spine is $5\frac{1}{2}$ in the total. Red, with lighter longitudinal bands.

a. Adult: stuffed. Louisiade Archipelago. Voyage of the Rattlesnake.

b. Adult: stuffed. Guadalcanar (Salomon Islands). Voyage of the Herald.

c. Half-grown. Amboyna. Purchased of Mr. Frank.

Description.—This species, in the form of the body and the number of the fins, is allied to *H. sammara*, but is distinguished by the feeble development of the spines; the scales are nearly smooth, with indistinct serrature; the opercles are scarcely striated; the sub- and inter-operculum and the humeral are entire, the spines are short and flat; the dorsal spines slender and somewhat flexible; the anal spine relatively short, and not very strong.

The height of the body is four times in the total length, the length of the head $3\frac{1}{3}$. The interspace between the eyes is nearly equally broad behind and in front, but with a slight concavity of the edges above the middle of the eye; the two bony ridges between the eyes diverge slightly in front to receive the groove for the processes of the intermaxillary bones; behind they terminate in a fan-like expansion, with about seven or eight radiating bony ridges; the groove reaches far backwards, and is about four-fifths of the length of the diameter of eye. The turbinal bone is not prominent. The upper maxillary does not reach to the middle of the eye, and the snout has the same length as the groove mentioned. The diameter of the eye is nearly one-third of the length of the head; the infraorbital arch is slightly denticulated, the tooth in front is obtuse, flat, and short. The striæ of the opercles have nearly disappeared in old specimens; in younger they are visible, especially on the inter-operculum, where they even terminate in small marginal teeth. The operculum has two flat spines, nearly equal in length; the upper and lower margins are obsoletely denticulated; the sub- and inter-operculum entire; the præoperculum has a vertical posterior margin, very finely serrated, and a flat short spine at the angle, rather longer than one-third of the posterior margin; the inferior edge of the præoperculum and the scapulary are serrated; the humeral is entire.

The first dorsal is formed by ten dorsal spines, rather elongated and slender; the second, third and fourth are the longest, not much shorter than the rays. The soft dorsal has a short spine in front, rather longer than the last of the spinous dorsal. The *caudal* is deeply forked; the upper lobe, which appears to be rather longer than the lower, is one-fifth of the total length. The anal spines have about the same relative length as generally in the species of *Holocentrum*; but the third is rather short, and $5\frac{1}{2}$ in the total length. The pectoral fins are shorter than the ventrals, they reach to the level of the thirteenth scale only of the lateral line; the ventrals terminate on the level of the fifteenth, far distant from the anus, which corresponds to the twenty-first scale.

The scales are not striated, but very finely ciliated at the posterior margin; one of the largest covers fully one-fourth of the eye.

The colour appears to be red, with lighter longitudinal bands; the fins show now no colour at all, except in the half-grown specimen, which has the spinous dorsal with a blackish superior edge.

	inches.	lines.
Total length	8	1
Height of the body	1	11

	inches.	lines.
Length of the head	2	2
Interspace between the eyes	0	6
Length of the snout	0	8
——— of the præopercular spine	0	4½
——— of the third dorsal spine	1	0½
——— of the eleventh dorsal spine	0	3
——— of the third dorsal ray	1	1½
——— of the third anal spine	1	4½
——— of the fourth anal spine	0	11
——— of the first anal ray	1	0

25. Holocentrum spinosum.

Corniger spinosus, *Agass. in Spix, Pisc. Bras.* p. 121. taf. 75.
Holocentrum cornigerum, *Cuv. & Val.* viii. p. 481.

D. 12 | 15. A. $\frac{4}{12}$.

The height of the body is 2½ in the total length. Infraorbital arch with four very strong spines, curved and directed backwards, longer than those of the præoperculum the anterior is shortest, one-third only of the length of the second, the second half the size of the third and fourth; the posterior suborbital bones strongly denticulated. Operculum and limbs and scales of præoperculum covered with acute spines; præoperculum with two strong spines at the angle, the upper of which is the longer; operculum with two spines of equal size, but shorter than those of the former.

Coast of Brazil.

26. Holocentrum retrospinis.

Holocentrum retrospinis, *Guichen. Poiss. in Ramon de la Sagra, Hist. de l'Ile de Cuba*, p. 35. pl. 1. f. 3.

D. 12 | 14. A. $\frac{3\,(?)}{11}$.

The height of the body is 2½ in the total length, the length of the head 2¾. The infraorbital arch is armed beneath with three long spines, curved and directed forwards; the spines of the præorbital and of the posterior part of the infraorbital arch with smaller spinous teeth. Both limbs of the præoperculum denticulated, with a rather strong flat spine; operculum and suboperculum armed with spinous teeth, the former with two long spines, the lower of which is the stronger. Spines of the fins rather slender; the soft portions of the dorsal and anal fins rounded, and as high as the spinous. Caudalis forked; scales deeply serrated. Uniform red.

Cuba.

This fish has a remarkable similarity to the preceding species, from the development of the armature of the head; but the spines of the infraorbital have an opposite direction. Guichenot describes the suboperculum as entire, and not denticulated; but it is evident from the figure that he has mistaken the interoperculum for it, the margin of the suboperculum being as strongly armed as that of the opercle. He mentions three anal spines only; but that would be an exception to the rule in this genus.

9. RHYNCHICHTHYS*.

Holocentrus, sp., *Gronov. Zoophyl.* p. 65. tab. 4. f. 3, and *Syst. ed. Gray*, p. 173.
Rhynchichthys, *Cuv. & Val.* vii. p. 503, viii. p. 508.

Muzzle more or less elongate, pointed, with prominent upper jaw; eye large. Villiform teeth in both the jaws, on the vomer and the palatine bones. Eight branchiostegals. Opercular bones serrated; operculum and angle of præoperculum with distinct spines. Scales moderate, ctenoid. Two dorsals, scarcely united; ventrals with seven rays. Caudal forked; anal with four spines, the third longest. Swim-bladder?

Tropical seas of both the hemispheres.

1. Rhynchichthys pelamidis.

Cuv. & Val. vii. p. 504. pl. 208.

D. $10 \left| \frac{1}{12} \right.$. A. $\frac{4}{12}$. L. lat. 35–40.

Bluish green, silvery on the sides and on the belly; a series of black spots between the dorsal spines.

Indian Ocean.

There is some similarity in the external physiognomy of this species and *Lepidoleprus japonicus*; moreover the number of the ventral rays is also increased in the latter fish. In other respects these fishes differ greatly from each other.

2. Rhynchichthys brachyrhynchus.

Bleeker, Amboina, iii. p. 17.

D. $10 \left| \frac{1}{13-14} \right.$. A. $\frac{4}{11-12}$. L. lat. 25.

Snout not projecting much beyond the mouth. Rose-coloured: the spinous dorsal brownish; the anterior rays of the soft dorsal and of the anal, a transverse band at the base, and a longitudinal band on each lobe of the caudal, deep violet; ventral fins black. (*Bl.*)

Sea of Amboyna.

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* 1. Holocentrus rostratus, *Gronov. l. c.*—Caribbean Sea. It is a pity that the specimen on which Gronovius founded this species is not contained in his Collection of dried fishes, which is now in the British Museum. There has not been found one fish of the whole family of Berycidæ in this Collection.

Fam. 3. PERCIDÆ.

Percoidei, pt., *Cuv. Règne Anim.*; *Cuv. & Val.* ii. p. 1; *Müller, Berl. Abhandlg.* 1844, p. 201.
Percidæ, pt., *Owen, Lect. Comp. Anat. Vert.* i. p. 49.
Percidæ et Theraponidæ, pt., *Richardson.*

Body generally oblong, and covered with ctenoid scales; lateral line continuous[*]. Mouth in front of the snout, with lateral cleft, rarely at the lower side. Eye lateral. All or some of the opercles serrated or armed[†]. Seven or six branchiostegals[‡]. Dentition complete; teeth pointed, in villiform bands, with or without canines; teeth either on the vomer, or on the vomer and palatine bones. No barbels[§]. Cheek not cuirassed. Dorsal fin formed by a spinous portion and by a soft; ventrals thoracic, with one spine and five soft rays. Stomach cæcal; pyloric appendages generally in small number. Swim-bladder present, simple[‖]. Intestines little folded

Carnivorous fishes, inhabiting the fresh waters and seas of all parts of the globe.

Synopsis of the Genera.

The following Synopsis is merely to facilitate the determining the position which a species of fish takes in the system of the Percoids known at present, whilst in the description itself a series has been adopted which is thought best adapted to the natural relations of the genera. Without fully repeating the diagnoses of the genera, it would have been impossible to follow the same succession in this Synopsis, and it would have failed in accomplishing the purpose above named. Thus it is not intended to give, in the single categories of the Synopsis, the forms most closely allied to one another, but certain forms are brought together by an artificial method. Finally, I consider the number of the spines to be a natural generic character, which, simple as it is, has hitherto been neglected in the definition of *genera.*

A. *Anomalous genera.*

* *With a barbel.* Two dorsals; operculum spiniferous, præoperculum denticulated; scales imbedded in the skin …	30. POGONOPERCA.
* *No teeth at all on the palate.* Natural characters of Serranus	25. PRIONODES.

B. *Normal genera.*

I. *Seven branchiostegals.*

A. *All the teeth villiform, without canines.*

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[*] Some species of *Ambassis* excepted.
[‡] Cfr. *Percilia.*
[‖] In *Pileoma* and *Bolcosoma* absent.
[†] Except *Apsilus.*
[§] Except *Pogonoperca.*

1. *Two distinct dorsals, separate or united only at the base.*

a. Scales adherent.

* *Pseudobranchiæ.*

** *Pyloric appendages in small number.*

a. Body oblong, flat.

† *D. with* 7 *spines.* The anal fin without conspicuous spines; operculum and præoperculum spiniferous, without serratures; scales minute... 31. Grammistes.

† *D. with* 8 *spines.*

†† *Scales rather large.* The dorsal fin moving in a scaly sheath; præoperculum with a strong spine at the angle, and with an entire lower limb.. 7. Psammoperca.

†† *Scales rather small.*

αα. Operculum without spines .... 16. Centropomus.

ββ. Operculum spiniferous .... 34. Diploprion.

† *D. with* 9 *spines.* Teeth on the tongue; the anal fin generally with three spines; præoperculum with denticulations beneath .... 4. Labrax.

† *D. with* 10 *spines.* The anal fin with two spines; muciferous cavities of the bones of the skull much developed; præoperculum denticulated; scales small .... 10. Percarina.

† *D. with* 12 *spines.* The anal fin with three spines; opercles with very long and pointed spines; scales very small....................................... 17. Niphon.

† *D. with* 13–14 *spines.* The anal fin with two spines; præoperculum and præorbital serrated; scales small; head naked above..................... 1. Perca.

β. Body cylindrical, elongate. Mouth situated at the lower side of the snout; anal fin with a single spine; præoperculum serrated; scales small ...... 14. Aspro

** *Pyloric appendages in increased number.*

a. Form of body oblong. Pseudobranchiæ developed; tongue smooth; the first dorsal with eleven, the anal fin with three spines; præoperculum with strong spinous teeth beneath; scales rather small. 8. Percalabrax.

β. Body and vertical fins greatly elevated. Præoperculum with spinous teeth at the angle .... 18. Enoplosus

* *No pseudobranchiæ.*

** *Præoperculum with strong spines at the lower border.* The first dorsal with seven to eight, the anal fin with three spines; scales moderate; præorbital strongly serrated .... 5. Lates.

** *Præoperculum with smooth lower limb,* and with a strong spine at the angle; præorbital entire .... 6. Cnidon.

b. Scales deciduous.

α. The lateral line commencing beneath the second dorsal. An acute ridge from the eye extending backwards over the opercles .... 43. Microichthys

β. The lateral line commencing behind the head.

aa. Teeth on the palatine bones.

αα Præoperculum with a double serrated ridge. The first dorsal with six to seven, the anal with two spines; operculum spiniferous .... 44. Apogon.

ββ. Præoperculum with a double entire ridge. The first dorsal with six, the anal with two spines; operculum spiniferous .... 45. Apogonichthys.

bb. No teeth on the palatine bones. Eye very large. No denticulations on the bones of the skull. Many pancreatic cæca .... 48. Pomatomus.

2. *The spinous dorsal little developed.*

Scales minute, enveloped in the epidermis; spines of the dorsal variable in number... 32. Rhypticus.

3. *One dorsal fin.*

a. With two or three anal spines.

α. Pyloric appendages in small number.

aa. Operculum with a strong bony ridge.

Opercles denticulated; scales small .... 29. Polyprion.

bb. Operculum without bony ridge.

§. *No teeth on the palatine bones.*

Opercles spiniferous; the muciferous channels of the bones of the skull much developed; scales rather small .... 9. Acerina.

§. *Teeth on the palatine bones.*

* *Operculum spiniferous.*

** *Scales moderate.*

† *D. with* 12–13 *spines.* Body rather elevated ...... 35. Myriodon.

† *D. with* 8 *spines.* Head entirely covered with scales .... 38. Glaucosoma.

** *Scales small.*

† *Operculum very strongly armed*; præoperculum with strongly serrated lower limb; dorsal with nine spines. *Known only from stuffed specimens.* 33. Aulacocephalus.

† *Operculum moderately armed*; præoperculum not, or obtusely serrated. Dorsal with eleven spines. 50. Oligorus.

* *Bones of the skull without any denticulations or spines.* Dorsal with ten spines; scales rather small.................. 20. Apsilus.

β. Pyloric appendages in increased number.

* *Præoperculum with spinous teeth at the lower limb.* Natural characters of *Plectropoma* .... 28. TRACHYPOMA.

* *Præoperculum finely serrated.* Dorsal with nine slender spines; operculum spiniferous; scales moderate .... 52. ARRIPIS.

b. With four or five anal spines.

Scales sometimes osseous. Body high, triangular; anal fin with five spines; præoperculum denticulated; operculum rounded .... 39. PENTACEROS.

c. Anal spines none.

No true scales; osseous protuberances.............................. 40. OREOSOMA.

B. Canine teeth at the outer side of the villiform bands.

1. Two dorsals.

* *Anal with two spines.*

a. Scales small, adherent. Twelve to fourteen dorsal spines; operculum spiniferous; præoperculum with a simple serrated edge .... 11. LUCIOPERCA.

b. Scales large, deciduous. Six dorsal spines; præoperculum with a double serrated edge .... 46. CHILODIPTERUS.

* *Anal with three spines.*

a. Operculum produced into a long, denticulated point .... 49. ACROPOMA.

b. Operculum with two points, not denticulated; scales moderate, adherent. Nine dorsal spines .... 15. ETELIS.

c. Operculum with two feeble points; scales moderate, deciduous. Eight dorsal spines; no denticulations on the bones of the skull .... 47. SCOMBROPS.

2. One dorsal.

a. Canines very small. Vomerine teeth in an angular band or a short triangular patch. Dorsal generally with the formula $\frac{10}{12}$, anal with $\frac{3}{7}$; operculum spiniferous; præoperculum serrated, without notch; scales moderate or rather small .... 21. CENTROPRISTIS.

b. Canines distinct.

- *α. Scales moderate.*
  - *aa. Præoperculum serrated.*
    - *αα. Snout short, blunt,* with a rather narrow præorbital; dorsal generally with ten, anal with three spines; caudalis forked, and mostly one or several of the fins elongate; operculum spiniferous.. 23. ANTHIAS.
    - *ββ. Snout rather elongate and high, with flat sides, and with a large broad præorbital.*
      - * *Præoperculum without or with a very open notch behind* .... 37. MESOPRION.
      - * *Præoperculum with a deep notch, receiving a knob of interoperculum*...... 36. GENYOROGE.
  - *bb. Præoperculum entire.* Dorsal with ten, anal with three spines; operculum spiniferous............... 19. APRION.

β. *Scales small.*

  aa. Præoperculum with the lower limb smooth.

    αα. Teeth on the palatines. Dorsal generally with nine or eleven spines, anal with three; operculum spiniferous .... 26. SERRANUS.

    ββ. No teeth on the palatines .... 24. ANYPERODON.

  bb. Præoperculum with spinous teeth beneath. Number of spines of the vertical fins variable; operculum spiniferous .... 27. PLECTROPOMA

II. *Number of branchiostegals varying between seven and six.*

A. *Two dorsals.* The first with nine spines, anal with three. Operculum spiniferous, præoperculum and præorbital serrated. Scales small, head covered with scales above. 2. PERCICHTHYS

B. *One dorsal.* With ten spines, anal with three; operculum with two points, præoperculum with a single smooth ridge. Scales moderate The number of the pyloric appendages increased .... 51. GRYSTES

III. *Six branchiostegals.*

A. All the teeth villiform

1. *Two dorsals.*

a. Scales deciduous. Præoperculum with a double denticulated ridge; the first dorsal with seven, the anal with three spines, a recumbent spine in front of the dorsal, pointing forward .... 42. AMBASSIS.

b. Scales adherent.

  * *D. with* 14 *or* 15 *spines.* Opercles not denticulated; operculum with one point .... 12. PILEOMA.

  * *D. with* 9 *spines.* Opercles not denticulated; operculum with one point .... 13. BOLEOSOMA

  * *D. with* 6 *spines.* Opercles not denticulated; operculum with two points.......... 53. HURO.

2. *One dorsal.*

a. Scales moderate, finely or minutely serrated.

  α. Operculum with a membranaceous coloured lobe above the angle.

    aa. No teeth on the palatine bones .... 57. POMOTIS.

    bb. Teeth on the palatine bones .... 56. BRYTTUS.

  β. Operculum without a membranaceous lobe.

    aa. The number of the anal spines variable, mostly more than three. Teeth on the palatine bones and on the tongue; operculum with two flat points; præoperculum scarcely denticulated .... 55. CENTRARCHUS.

    bb. Three anal spines. Dorsal with ten spines; operculum spiniferous; præoperculum serrated... 60. DULES.

b. Scales small, rough. Chin very prominent, snout covered with ctenoid scales, eye large; præoperculum with prominent crenulated angle; dorsal with ten, anal with three spines .... 41. PRIACANTHUS

B. Jaws with a lateral series of larger teeth, or with canines.

1. *With canines.* Snout very short, rounded; fins partly elongated; dorsal with eleven spines; operculum spiniferous; præoperculum entire .... 22. Callanthias.

2. *With a lateral series of larger teeth.*

  a. *Operculum spiniferous; spines of the fins slender.* Form of body cylindrical; dorsal deeply notched, the first portion with nine spines; præoperculum serrated; scales small .... 3. Paralabrax.

  b. *Operculum not armed; spines of the fins very strong.* Form of body rather elevated; dorsal deeply notched, the first portion with ten spines; scales rather small. 58. Anoplus.

  c. *Operculum indistinctly armed; basal half of the dorsal fin scaly.* Form of the body compressed, oblong; one dorsal, with ten spines; scales moderate, not serrated; caudal deeply forked .... 59. Odontonectes.

IV. *Number of the branchiostegals varying between five and six.*

No canine or palatine teeth. Two dorsals, united at the base only; the first with nine spines, the anal with three; no distinct armature on the opercles; scales moderate .... 54. Percilia.

These genera may be combined into more natural groups. In these groups one or other of the manifold characters predominates, without being applicable to every member of the group. If we follow Cuvier and make the categories strictly depend upon one character, then we are obliged to separate *Perca* and *Percichthys*, merely because the former has seven, the latter sometimes six branchiostegals—or *Grammistes* and *Rhypticus*, merely because in the former the spinous part of the dorsal is more developed, and separated from the soft one by a deep notch—or *Apogon* and *Chilodipterus*, because in one there are conspicuous canines; and yet there are no fishes more closely allied than those of the three pairs mentioned. When we become acquainted hereafter with more generic forms, then the *Percidæ* will be divided into many groups or families with more exact characters; and the following natural combination is merely an attempt at a systematic division of these fishes.

I. *Group with the type of Perca.*—Mostly freshwater fishes, or sea fishes entering the rivers. Form of the body oblong, rarely cylindrical or elevated. Opercles strongly denticulated or armed. Scales conspicuously ctenoid, small, or of moderate size. Cleft of mouth horizontal or slightly oblique. Mostly with two dorsals; the number of spines constant in the species of one genus. Rarely more than ten pyloric appendages. **Percina.**

1. Perca.
2. Percichthys.
3. Paralabrax.
4. Labrax.
5. Lates.
6. Cnidon.
7. Psammoperca.
8. Percalabrax.
9. Acerina.
10. Percarina.
11. Lucioperca.
12. Pileoma.
13. Boleosoma.
14. Aspro.
15. Etelis.
16. Centropomus.
17. Niphon.
18. Enoplosus.

II. *Group with the type of Serranus.*—Mostly inhabitants of the sea. Form of the body oblong, rarely elevated. Opercles denticulated or armed. Scales conspicuously ctenoid, small, or of moderate size. Cleft of mouth slightly oblique. Mostly with one dorsal; the number of spines constant, or little variable in the species of one genus. Sometimes more than ten pyloric appendages. **Serranina.**

19. Aprion.
20. Apsilus.
21. Centropristis.
22. Callanthias.
23. Anthias.
24. Anyperodon.
25. Prionodes.
26. Serranus.
27. Plectropoma.
28. Trachypoma.
29. Polyprion.
30. Pogonoperca.
31. Grammistes.
32. Rhypticus.
33. Aulacocephalus.
34. Diploprion.
35. Myriodon.
36. Genyoroge.
37. Mesoprion.
38. Glaucosoma.

III. *Group with the type of Pentaceros.*—Osseous scales or protuberances, or the integuments of the head bony. **Pentaceratina.**

39. Pentaceros.
40. Oreosoma.

IV. *Group with the type of Priacanthus.*—Cleft of the mouth approaching the vertical line, chin prominent; scales small, strongly ctenoid, rough; the number of spines constant; few pyloric appendages. **Priacanthina.**

41. Priacanthus.

V. *Group with the type of Apogon.*—Inhabitants of the sea and of fresh waters, with deciduous scales generally of large size. Form of the body more or less elevated. Opercles mostly denticulated or armed; cleft of the mouth oblique, or approaching the vertical line. Two dorsals. **Apogonina.**

42. Ambassis.
43. Microichthys.
44. Apogon.
45. Apogonichthys.
46. Chilodipterus.
47. Scombrops.
48. Pomatomus.
49. Acropoma.

VI. *Group with the type of Grystes.*—Inhabitants of the sea and chiefly of fresh waters. Form of the body oblong or elevated. Opercles indistinctly denticulated or armed, or entirely smooth. Scales minutely ciliated, or cycloid. Cleft of the mouth more or less oblique. Mostly with one dorsal; spines sometimes in variable number in one genus. Sometimes many pyloric appendages. Fishes deviating most from the original type of the *Percoids*; and *Dules* approaching to the *Theraponidæ.* **Grystina.**

50. Oligorus.
51. Grystes.
52. Arripis.
53. Huro.
54. Percilia.
55. Centrarchus.
56. Bryttus.
57. Pomotis.
58. Anoplus.
59. Odontonectes.
60. Dules.

First Group. PERCINA.

1. PERCA[*].

Perca, sp., *Artedi, Genera*, p. 39; *Cuv. Règne Anim.*; *Cuv. & Val.* ii. p. 19.

Seven branchiostegals. All the teeth villiform, without canines: teeth on the palatine bones, tongue smooth. Two dorsals; the first with 13 or 14 spines; anal fin with two spines. Operculum spiniferous; præoperculum and præorbital serrated. Scales small; head naked above.

Fresh waters of the Arctic Regions.

1. Perca fluviatilis.

Πέρκη, *Aristot.* vi. cap. 14; *Ælian*, xiv. c. 23, 26.

Perca, *Plin.* xxxii. cap. 9, 10; *Auson.* v. 115; *Johnston, Thaum.* p. 423.

Perca fluviatilis, *Rondel.* ii. pp. 196, 197; *Salviani*, f. 224 *b*, 226; *Gesner*, p. 698. f. 168 *b*; *Ray, Syn. Pisc.* p. 97. no. 23; *Willughby*, iv. c. 14. p. 291. t. 5. 13. f. 1; *Penn. Brit. Zool.* iii. p. 345.

—— fluviatilis major, *Aldrov.* v. cap. 33. p. 622.

—— major, *Schoner.* p. 55.

—— no. 1, *Artedi, Genera Piscium*, p. 39.

—— fluviatilis, *Linn.* i. p. 481, and *Faun. Suec.* p. 117; *Lacép.* iv. p. 187; *Marsigli*, iv. tab. 23. f. 1; *Bloch, Fische Deutschl.* t. 52; *Schæffer, Pisc. Bavar. Ratisb. Pentas.*; *Meidinger, Fische Oestr.* tab. 5; *Don. Brit. Fishes*, iii. pl. 52; *Shaw, Zool.* iv. p. 545. pl. 79; *Turt. Brit. Faun.* p. 100; *Cuv. & Val.* ii. p. 20. pl. 1–8 (anatomy); *Flem. Brit. Anim.* p. 213; *Nilss. Prodr. Ichth. Scandin.* p. 81; *Jurine, Poiss. Lac Leman*, pl. 3; *Bonap. Faun. Ital.* iii. 79. f. 1; *Fries och Eckstr. Skandinaviens Fiskar*, pl. 1; *Yarrell, Brit. Fishes*, p. 1; *Parn. Fish. Frith of Forth*, p. 8; *Demidoff. Voy. Russ. Mérid.* iii. p. 355; *Cuv. Règne Anim. Ill. Poiss.* pl. 1–4, (anat.) pl. 6; *Günther, Neckarfische*, p. 10, and *Wiegm. Archiv*, 1855, p. 198; *Heckel & Kner, Süsswasserfische*, p. 3 (fig. not good).

—— vulgaris et helvetica, *Gronov. Mus. Ichth. ed. Gray*, pp. 113, 114.

—— italica, *Cuv. Règne Anim.*; *Cuv. & Val.* ii. p. 45.

D. 14–15 | $\frac{1-2}{13-14}$. A. $\frac{2}{8-9}$. Cæc. pylor. 3. Vert. 21/20–21.

Total length equal to $3\frac{3}{4}$ the height of the body. Inferior edge of operculum entire, or very weakly denticulated; inferior edge of præoperculum with a few strong spinous teeth, directed forwards; operculum smooth, more than 70 transverse rows of scales[†]; transverse line $\frac{9}{19}$. A large black mark on the posterior part of the first dorsal fin.

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[*] Perca plumieri, *Cuv. & Val.* ii. p. 51, established from a figure of Plumier, is the same fish as we find hereafter described as Conodon antillanus. *Cuv. & Val.* v. p. 156.

[†] In the Percidæ with small scales, the rows exhibit many irregularities, especially near the lateral line. A more constant result is gained by counting the transverse rows, instead of the scales of the lateral line

Europe; Asiatic Russia.

a, b. Large specimens: stuffed. England.
c. Adult: stuffed. England.
d, e. Adult. England.
f. Half-grown. England. Presented by J. Doubleday, Esq.
g. Half-grown. England. Presented by the Zoological Society.
h. Half-grown. Peterborough. Presented by C. Watkins, Esq.
i, k. Young. London. Presented by W. Yarrell, Esq.
l. Adult: skin. Norfolk. Mr. Yarrell's Collection.
m–t. Adult and half-grown: skins. England. Mr. Yarrell's Collection.
u. Adult: stuffed. Loch Lomond, Scotland.
v. Half-grown: stuffed. Duddingston, Scotland.
w. Half-grown: stuffed. Loch Maben, Scotland.
x, y, z. Half-grown. Switzerland. Presented by Prof. Agassiz.
α, β. Large specimens. Sweden. From Mr. Lloyd's Collection.
γ. Young. Sweden. From Mr. Lloyd's Collection.
δ. Adult: skin. Sweden. Mr. Yarrell's Collection.
ε. Adult: skin. Europe. Mr. Yarrell's Collection.
ζ, η. Adult. Europe. Presented by the College of Surgeons.
θ, ι. Half-grown. Europe. Presented by the College of Surgeons.
κ, λ. Half-grown. Sine patria. From the Haslar Collection.
μ. Young. From the Collection of the Zoological Society.
ν. Adult: skeleton. England.

2. **Perca flavescens.**

Bodianus flavescens, *Mitchill, Ph. Trans. New York*, i. p. 421.
Perca flavescens, *Cuv. Règne Anim.*; *Cuv. & Val.* ii. p. 46; *Richardson, Faun. Bor.-Amer., Fishes*, p. 1. pl. 74; *Storer, Report*, p. 5, and *Synopsis*, p. 17, and *Bost. Journ. Nat. Hist.* iv. p. 175; *Kirtland, in Bost. Journ.* v. p. 337. pl. 27. f. 2 (bad); *Dekay, New York Fauna, Fishes*, p. 3. pl. 1. f. 1; *Holbrook, Ichth. S. Carol.* p. 2. pl. 1. f. 1: *Agassiz, Lake Superior*, p. 291.
—— granulata, *Cuv. & Val.* ii. p. 48. pl. 9, cop. by *Dekay, New York Fauna*, p. 5. pl. 68. f. 220.
—— serrato-granulata, *Cuv. & Val.* ii. p. 47; *Dekay, l. c.* pl. 22. f. 64.

D. 13–14 | $\frac{1\text{–}2}{13\text{–}14}$. A. $\frac{2}{7\text{–}8}$. Cæc. pylor. 3. Vert. 21/20.

Total length equal to $3\frac{3}{4}$ or four times the height of the body. Inferior edge of operculum with a few weak denticulations; inferior edge of præoperculum with about ten rather slender spinous teeth, directed forwards; operculum striated; 60 to 65 transverse rows of scales; transverse line $\frac{6}{17}$. A large black mark on the posterior part of the first dorsal fin.

United States; Canada.

a. Adult. New York. From Mr. Brandt's Collection.
b. Adult. Boston. Presented by J. Winstone, Esq.

c. Adult: female skeleton. Ohio. From Mr. Frank's Collection as *Perca americana*.
d. Adult: stuffed. Canada.
e. Adult. N. America. From Mr. Warwick's Collection.
f, g. Adult. N. America. From Mr. Warwick's Collection.
h. Adult: stuffed. N. America. Presented by Edw. Doubleday, Esq.
i, k. Adult: skins. Montezuma, U.S. From Dr. Parnell's Collection.
l. Intestines of specimen *c.*

Skeleton.—The structure of the single bones of the skull is exactly the same as in the Common Perch; the slight differences are the following: the radiating streaks on the upper surface of the head and on the operculum, which are to be seen also in the Common Perch, are here deeper and more developed; the spines of the operculum are more acute, and there is beneath the longest a third, much smaller, but very conspicuous; there are eight spinous teeth along the lower limb, directed forwards. Vert. 21/20. The first interhæmal is attached to the twenty-second vertebra, as in the Common Perch; and from an examination of the skeletons, I am still more inclined to consider both to be varieties of one and the same species.

Var. PERCA ACUTA.

Cuv. & Val. ii. p. 49. pl. 10; *Richardson, Faun. Bor.-Amer., Fishes,* p. 4; *Dekay, New York Fauna, Fishes,* p. 6. pl. 68. f. 222.

$$\text{D. } 13\text{–}14 \,\Big|\, \tfrac{2}{14}. \quad \text{A. } \tfrac{2}{7}.$$

Total length equal to $3\frac{3}{4}$ the height of the body. Inferior edge of operculum with a few rather strong denticulations; inferior edge of præoperculum with numerous weak spinous teeth; operculum striated; transverse rows?; transverse line?. No black spot on the first dorsal fin.

Lake Ontario.

3. Perca gracilis.

Cuv. & Val. p. 50; *Richardson, Faun. Bor.-Amer., Fishes,* p. 4.

$$\text{D. } 13 \,\Big|\, \tfrac{1}{14}. \quad \text{A. } \tfrac{2}{6}.$$

Total length equal to five times the height of the body. Inferior edge of operculum entire; edges of præoperculum with numerous nearly equal, very small spinous teeth; operculum striated; more than 70 transverse rows of scales; transverse line $\frac{6}{17}$. A small black spot on the hinder part of the dorsal fin.

Lake Skaneateles (system of Ontario); Canada.

a. Adult: stuffed. Canada.

This species is considered by Holbrook to be a variety of *Perca flavescens*.

2. PERCICHTHYS.

Perca, sp., *Cuv. & Val.* ii. p. 19.
Percichthys, *Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 197, and *U.S. Nav. Astron. Exped.* ii., *Zool.* p. 230.

Seven or six branchiostegals. All the teeth villiform, without canines; teeth on the palatine bones, tongue smooth. Two dorsals, the first with nine (or ten) spines; anal fin with three spines. Operculum spiniferous; præoperculum and præorbital serrated. Scales small; head covered with scales above.

Fresh waters of the Neotropical region. (Java.)

1. Percichthys lævis.

Perca lævis, *Jenyns, Zool. of the Beagle, Fishes,* p. 1. pl. 1.

$$\mathrm{D.}\ 9\,\Big|\,\tfrac{1}{11}.\quad \mathrm{A.}\,\tfrac{3}{9}.$$

Height of the body not quite one-fifth of the total length, the head not quite one-fourth. Head above covered with scales, as far as the connecting line of the nostrils; scales rather smooth, scarcely at all ciliated. Caudals slightly notched. Yellowish brown (in spirits), covered all over with small dusky spots, one occupying the base of each scale. (*Jenyns.*)

Santa Cruz River, Patagonia.

2. Percichthys trucha.

Perca trucha, *Cuv. & Val.* ix. p. 429; *Guichen. in Gay, Historia de Chile, Zool.* ii. p. 146. pl. 1 *b*. fig. 1. [It appears doubtful, from Girard's examination, whether this figure is made from a specimen, or from the description given by Valenciennes.]
Percichthys trucha, *Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 197.
? Percichthys chilensis, *Gir. in U.S. Nav. Astron. Exped.* ii., *Zool.* p. 231. pl. 29. f. 1–4.

$$\mathrm{B.}\ 7.\quad \mathrm{D.}\ 9\,\Big|\,\tfrac{1}{13}.\quad \mathrm{A.}\ \tfrac{3}{10}.$$

The upper maxillary bone reaching to below the middle of the eye; sub- and interoperculum scarcely denticulated; caudalis moderately emarginated; scales ciliated. Yellowish brown, spotted with darker.

Rio Negro (Patagonia); fresh waters of Chili.

3. Percichthys melanops.

Girard, Proc. Ac. Nat. Sc. Philad. 1854, p. 197; *U.S. Nav. Astron. Exped.* ii., *Zool.* p. 233. pl. 30. f. 1–5.

$$\mathrm{B.}\ 6.\quad \mathrm{D.}\ 10\,\Big|\,\tfrac{1}{10}.\quad \mathrm{A.}\,\tfrac{3}{9}.\quad \mathrm{L.\ lat.}\ 58\text{–}60.\quad \mathrm{L.\ transv.}\ 10/22.$$

Branchiostegals six; the upper maxillary bone reaching to the level of the anterior margin of the eye; opercular spine not very conspicuous. Ground-colour whitish, minutely and densely dotted with black; dots crowded in the middle of the scales in the shape of a central blotch.

Rio de Maypo, Chili.

The two following species are too little known to be brought into this genus with certainty; but being evidently good species, I think it better to place them here than to neglect them.

4. Percichthys ciliata.

Perca ciliata (*Kuhl & v. Hasselt*), *Cuv. & Val.* ii. p. 52.

$$D.\ 9\,\Big|\,\frac{1}{11}.\quad A.\ \frac{3}{10}.$$

Height of the body not quite one-fourth of the total length. Scales strongly ciliated. Above uniform greenish; no black spot on the dorsal fin.

Java.

5. Percichthys marginata.

Perca marginata, *Cuv. & Val.* ii. p. 53.

$$D.\ 9\,\Big|\,\frac{1}{17}.\quad A.\ \frac{3}{10}.$$

Height of the body one-fourth of the total length; edge of operculum entire: edges of præoperculum equally and finely denticulated; caudal fin forked, black-edged.

Hab. ——?

3. PARALABRAX.

Paralabrax, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 131.

Habit cylindrical. Six branchiostegals. Pseudobranchiæ? Teeth villiform, with a series of larger ones on each side of the jaws; teeth on the palatines, tongue smooth. One dorsal, deeply notched, the first portion with nine spines; the anal fin with three. Operculum spiniferous; præoperculum serrated. Scales small.

Fresh waters of California.

1. Paralabrax nebulifer.

Labrax nebulifer, *Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 142.
Paralabrax nebulifer, *Girard, l. c.* 1856, p. 131.

$$D.\ 9\,\Big|\,\frac{1}{14}.\quad A.\ \frac{3}{8}.$$

Total length not quite four times the height of the body; lateral line?; third dorsal spine longest. Back reddish brown, with large cloud-like blackish blotches; snout covered with small roundish spots; a dark band from the orbit across the cheeks to the gills.

Monterey (California).

2. Paralabrax clathratus.

Labrax clathratus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 143.
Paralabrax clathratus, *Girard, l. c.* 1856, p. 131

$$D.\ 9\left|\frac{1}{13}.\right.\quad A.\ \frac{3}{7}.$$

Total length not quite four times the height of the body; lateral line?; fourth dorsal spine longest. Back purplish; back and sides covered with darker blotches; second dorsal spotted; a dark temple-streak.

San Diego (California).

4. LABRAX*.

Labrax, *Cuv. Règne Anim.*; *Cuv. & Val.* ii. p. 55.

Seven branchiostegals; pseudobranchiæ developed. All the teeth villiform, without canines; teeth on the palatine bones and on the tongue. Two dorsals, the first with nine spines; anal fin generally with three. Operculum spiniferous; præoperculum serrated, and with denticulations at the lower limb; præorbital entire. Scales rather small or moderate. Number of pyloric appendages few (4–5).

Shores of the Arctic Regions; Rivers of North America.

1. Labrax lupus.

Λάβραξ, *Aristot.* i. cap. 5, iv. cap. 11, v. cap. 10, vi. cap. 13, 19, viii. cap. 19, and *De Part Anim.* iv. cap. 8, viii. cap. 2, 30; *Ælian*, i. cap. 30, ix. cap. 7, x. cap. 2, xvi. cap. 12; *Athen.* lib. vii. xiv.; *Oppian*, i. cap. 5, ii. cap. 34, 58.
Lupus, *Plin.* ix. cap. 17, 54, xxxii. cap. 2; *Bellon. Aquat.* i. p. 113; *Salv. Aquat.* xxviii. p. 108. f. 30; *Rondel. Pisc. Mar.* ix. cap. 7, cum fig.; *Gesner*, iv. p. 506; *Aldrov. Pisc.* iv. cap. 2. p. 490, cum fig.; *Jonston*, ii. cap. 2; *Willughby*, iv. cap. 1. p. 271. tab. R. 1; *Ray, Syn. Pisc.* p. 83.
Perca no. 7, *Artedi, Gen. Pisc.* p. 41.
Perca labrax, *Linn. Syst. Nat.* i. p. 482; *Risso, Ichth. Nic.* p. 299, and *Hist. Nat.* iii. p. 406; *Nilss. Prodr. Ichth. Scandin.* p. 82; *Penn. Brit. Zool.* p. 348. t. 66; *Donov. Brit. Fishes*, pl. 43; *Turton, Brit. Faun.* p. 100; *Flem. Brit. Anim.* p. 213; *Sonnini, Voy.* i. p. 217. pl. 3; *Schagerström, R. Vet. Acad. Hand.* 1829, St. i. p. 90. tab. 3. f. 5–7; *Martens, Reise nach Venedig*, ii. p. 428; *Gronov. ed. Gray*, p. 115 (not *Pallas*).
Perca punctata, *Gmel. Syst. Nat.* i. p. 1311; *Lacép.* iv. p. 418; *Risso, Hist. Nat.* iii. p. 407.
Centropomus lupus, *Lacép.* iv. p. 267.
Perca diacantha, *Lacép.* iv. p. 418; *Schneid. Bl. Syst.* p. 85.
Sciæna labrax, *Bloch*, iii. p. 45. t. 301 (bad); *Shaw, Zool.* iv. p. 534.
—— punctata, *Bloch*, t. 305 (jun.); *Shaw, Zool.* iv. p. 536.
—— diacantha, *Bloch*, t. 302; *Shaw, Zool.* iv. p. 535.

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* 1. Labrax nigricans, *Dekay, New York Fauna, Fishes*, p. 12. pl. 50. f. 160.—Freshwater ponds of New York.
2. Labrax albidus, *Dekay, l. c.* p. 13. pl. 51. f. 165.—Lake Erie.

Labrax lupus, *Cuv. Règne Anim.*; *Cuv. & Val.* ii. p. 56. pl. 11; *Yarr. Brit. Fishes*, i. p. 8; *Bonap. Faun. Ital.*; *Cuv. Règne Anim. Ill. Poiss.* pl. 7. f. 1; *Barker-Webb & Berthel. Iles Canar. Ichthyol.* p. 5; *Guichenot, Poiss. in Explorat. d'Algérie*, p. 31.
Geoffr. Descr. de l'Eg., Poiss. pl. 20. f. 2, 3 (Perche nocte et sinueuse).

D. $9 \left| \frac{1}{12-13} \right.$. A. $\frac{3}{10}$. Cæc. pylor. 5. Vert. 12/13.

Total length equal to $4\frac{1}{2}$ the height of the body; 60 to 70 transverse rows of scales: inferior edge of præoperculum with three strong spinous teeth, directed forwards. Back and sides greenish grey, in females and younger individuals with small black spots; belly white.

Mediterranean; coasts of Portugal, France, and England.

a. Large specimen: stuffed. England.
b. Adult. England.
c. Adult: stuffed. England.
d, *e*. Half-grown. England.
f. Half-grown. England. Presented by W. Yarrell, Esq.
g. Half-grown: stuffed. England.
h. Young. England. Old Collection.
i. Young. England. Presented by W. Yarrell, Esq.
k. Adult: stuffed. Frith of Forth.
l. Adult. Europe. From the Haslar Collection.
m–o. Half-grown. Europe.
p, *q*. Young. Europe.
r, *s*. Adult: stuffed. Europe.
t. Adult: skin. Solway.
u. Half-grown: skin. South Devon.
v. Half-grown: skin. England. From Mr. Yarrell's Collection.
w, *x*. Adult: skin. Lisbon.
y. Adult: skin. Europe.
z. Adult: skeleton. England.

2. **Labrax elongatus.**

Perca elongata, *Geoffr. Descr. de l'Eg., Poiss.* pl. 19. f. 1.
Labrax elongatus, *Cuv. & Val.* ii. p. 77.

D. $9 \left| \frac{2}{14} \right.$. A. $\frac{2}{10}$.

Total length equal to five times the height of the body; transverse rows?; inferior edge of præoperculum with more than five spinous teeth of moderate size. Back and sides greenish grey; belly white.

North coast of Egypt.

3. **Labrax lineatus.**

Schöpf, Schriften der Gesellsch. Naturforsch. Freunde, viii. p. 160.
Perca saxatilis, *Bl. Schn.* p. 89.
—— septentrionalis, *Bl. Schn.* p. 90. t. 20.
Sciæna lineata, *Bl.* t. 304.

Centropomus lineatus, *Lacép.* iv. 255.
Roccus striatus, *Mitchill, Report,* p. 25.
Perca mitchilli, *Mitchill, Trans. New York,* i. p. 413. pl. 3. f. 4.
Labrax lineatus, *Cuv. & Val.* ii. p. 79; *Dekay, New York Fauna, Fishes,* p. 7. pl. 1. f. 3; *Baird in Ninth Smithson. Report,* p. 321; *Holbr. Ichth. S. Carol.* p. 17. pl. 4. f. 1.

D. $9 \mid \frac{1}{12}$. A. $\frac{3}{11}$. L. lat. 57–62. L. transv. 9/11.

Total length equal to $4\frac{1}{3}$ the height of body; teeth of the tongue in two elongate oval patches; teeth of the inferior edge of præoperculum not much stronger than those of the hinder one. Seven or eight black longitudinal bands.

Eastern coasts of North America from Maine to Georgia.

a. Adult. North America. From Mr. Warwick's Collection.
b, c. Adult. North America. From Mr. Warwick's Collection.
d. Adult: stuffed. North America. Presented by Edward Doubleday, Esq.
e. Adult: skin. New York. From Dr. Parnell's Collection.
f. Adult: skin. New York. From Dr. Parnell's Collection.—The bands are irregularly waved and interrupted (*Perca mitchilli interrupta*).

4. **Labrax osculatii.**

Filippi, Rev. Magaz. Zool. 1853, p. 164.

D. $9 \mid \frac{1}{13}$. A. $\frac{3}{13}$. L. lat. 56. L. transv. 9/15.

The height of the body is one-third of the total length; teeth of the tongue arranged in a single oval patch; teeth of the inferior edge of præoperculum not much stronger than those of the hinder one. Seven or eight black longitudinal bands.

Eastern coasts and rivers of the United States.

5. **Labrax rufus.**

Morone rufa, *Mitchill, Report,* p. 18.
Perca mucronata, *Rafinesque, Monthly Magazine,* ii. p. 205.
? Perca americana, *Schöpf, Naturforscher,* xx. p. 17, and *Schriften der Naturf. Freunde Berlin,* viii. p. 159; *Schneider, Bloch,* p. 88; *Lacép.* iv. p. 412.
Labrax mucronatus, *Cuv. & Val.* ii. p. 86. pl. 12; *Baird in Ninth Smithson. Report,* p. 322.
—— rufus, *Dekay, New York Fauna, Fishes,* p. 9. pl. 3. f. 7.
—— americanus, *Holbr. Ichth. S. Carol.* p. 21. pl. 3. f. 2.

D. $9 \mid \frac{1}{12-13}$. A. $\frac{3}{9-11}$. Cæc. pylor. 4 (–5). L. lat. 50–55.
Vert. 11/14.

Total length equal to $3\frac{1}{2}$ the height of body; edges of præoperculum nearly equally and finely denticulated. Brownish grey, with more or less obsolete darker bands.

Eastern shores of the United States from Massachusetts to South Carolina.

a. Large specimen. Boston. Presented by W. Winstone, Esq.
b. Adult female: skeleton. New York. From Mr. Brandt's Collection.
c. Adult. New Orleans. From Mr. Cuming's Collection.
d. Half-grown. America. Old Collection as *Perca totog.*
e, f. Adult and half-grown: skins. New York. From Dr. Parnell's Collection.
g. Intestines of specimen *b.*

The liver is proportionally small, divided by a slight incisure into two parts, the left of which is larger, and distinguished by a still slighter furrow. There are four pyloric appendages, half as long as the stomach. Two separated ovaria. Pseudobranchiæ well developed.

Skeleton.—The paroccipital crest is high, triangular, pointed behind; the upper side in a straight line with the surface of the head, obliquely ascending. The ridges at the side of the skull are modified into muciferous channels: the præorbital bone exhibits several cavities, as in *Acerina cernua*, but not quite so deep; they communicate with the suborbital arch, which is narrow and forms the middle part of this channel; at the upper posterior corner of the orbit the channel is continued by an excavated bony ridge, running to the mastoid bone; here it is turned up and backwards, passes the upper articulation of the suprascapula, and is lost near the suture of the supraoccipital and of the frontal bones. A second pair of muciferous channels is found at the upper surface of the head, running in a straight line from the maxillary bone between the orbits to the middle of the frontals, opening by two or three lateral holes. The third muciferous channel runs in an elevated second ridge of the præoperculum, as in *Chilodipterus*, *Apogon*, &c.; it is continued on the lower surface of the mandibula, where it opens by four oval holes. I have formerly (*Wiegm. Arch.* 1855, p. 200) pointed out that such muciferous channels are to be found also in *Perca* and *Lucioperca*, and I may now add, in all the Percoids, but less developed: not forming a good generic character by itself, but combined with the fine serrature at the lower limb of the præoperculum, it may some day cause the separation of this species from *L. lupus*, &c.

The suborbital arch has no interior process for supporting the eye-ball from beneath, as is observed in a great many Percoids. The maxillary bone has the superior margin more convex than the inferior one. Operculum with two points, the upper one short and rounded, the lower prominent and acute. Præoperculum finely serrated throughout; posterior margin straight-lined; angle rounded; lower margin slightly convex; interoperculum with some excessively minute denticulations; suboperculum entire. All the teeth are villiform, arranged in bands: those of the vomer form an obtuse angle. The interior plate of the pubic bones is broad, in immediate contact with that of the other side, without leaving an interspace between. The first interhæmal is of moderate strength, equal to the length of the second to sixth vertebræ, and attached to the hæmal of the twelfth.

6. Labrax pallidus.

Morone pallida, *Mitchill, Report*, p. 18.
Bodianus pallidus, *Mitchill, Trans. Lit. & Phil. Soc.* i. p. 420.
Labrax pallidus, *Dekay, New York Fauna*, p. 11. pl. 1. f. 2.

$$\text{D. } 9 \,\Big|\, \frac{1}{12}. \quad \text{A. } \frac{3}{7}.$$

The height of the body is $3\frac{1}{2}$ in the total length; the edges of the præoperculum nearly equally and finely denticulated. Light bluish above, paler beneath.

Eastern shores of the United States.

a. Adult. America.

7. Labrax multilineatus.

Cuv. & Val. iii. p. 488; ? *Kirtland in Bost. Journ.* v. p. 21. pl. 7. f. 1 (not good).

$$\text{D. } 9 \,\Big|\, \frac{1}{13\text{–}14}. \quad \text{A. } \frac{3}{12}.$$

Total length equal to $3\frac{1}{2}$ the height of the body; 50 transverse rows of scales. Sixteen to nineteen black longitudinal bands.

River Wabash.

8. Labrax notatus.

Labrax notatus (*Smith*), *Richardson, Faun. Bor.-Amer., Fishes*, p. 8.

$$\text{D. } 9 \,\Big|\, \frac{1}{12}. \quad \text{A. } \frac{1}{12}.$$

Total length equal to four times the height of the body; lateral line with 58 scales. Marked with rows of spots, five above and five below the lateral line, very regularly interrupted and arranged.

Coast of Canada.

5. LATES.

Lates, *Cuv. Règne Anim.*; *Cuv. & Val.* ii. p. 88.

Seven branchiostegals; pseudobranchiæ absent. All the teeth villiform, without canines; teeth on the palatine bones, tongue smooth. Two dorsals; the first with seven or eight, the anal fin with three spines. Operculum spiniferous; præoperculum with strong spines at the angle and at the lower limb; præorbital strongly serrated. Scales moderate.

Nile. Mouths of the large East Indian rivers.

1. Lates niloticus.

Λάτος, *Athen.* p. 311.
Perca nilotica, *Gmel. Syst. Nat.* 1312; *Bl. Schn.* p. 87.
Centropomus niloticus, *Lacép.* iv. p. 278.

Prosper Alpin, Res. Eg. iv. c. 2; *Sonnini, Voy.* ii. p. 292. t. 22. f. 3; *Hasselq. Voy.* p. 359; *Geoffr. Descr. de l'Eg., Poiss.* pl. 9. f. 1.
Lates niloticus, *Cuv. & Val.* ii. p. 89, iii. p. 490.

D. 7 (–8) | $\frac{1}{12}$. A. $\frac{3}{8\,(-9)}$. Cæc. pylor. 5.

Præoperculum with a right angle; coracoid with five denticulations; second and third spine of the analis nearly equal in length. Back brownish, sides and belly silvery white.

Nile.

2. Lates calcarifer.

Holocentrus calcarifer, *Bloch*, t. 244.
Russell, ii. t. 131.
Holocentrus heptadactylus, *Lacép.* iv. pp. 344, 391.
Coius vacti, *Ham. Buch. Ganges, Fishes*, t. 16. f. 28.
Lates nobilis, *Cuv. & Val.* ii. p. 96. t. 13; *Richardson, Ichth. China*, p. 222; *Bleeker, Perc.* p. 27; *Cantor, Catal.* p. 1; *Hageman in Natuurk. Tydschr. Nederl. Ind.* 1851, p. 348.

D. 7–8 | $\frac{1}{12}$. A. $\frac{3}{8-9}$.

Præoperculum with an obtuse angle; coracoid with six to ten denticulations; third spine of analis nearly twice as long as second. Back and sides brownish, shining, belly white.

Mouths of the large East Indian rivers.

a. Half-grown. India. From Mr. Brandt's Collection as *Lates argenteus*.
b. Half-grown. India. Presented by the Zoological Society.
c. Half-grown. India. Presented by G. R. Waterhouse, Esq.
d, e, f. Adult: stuffed. Ganges. From Mr. Warwick's Collection.
g. Adult: stuffed. China. Presented by the East India Company.
h. Half-grown: stuffed. China. Presented by J. R. Reeves, Esq.
i. Adult: skin. China. From Mr. Warwick's Collection.

6. CNIDON.

Cnidon, *Müll. & Trosch. Hor. Ichth.* p. 21.

Seven branchiostegals; pseudobranchiæ absent; all the teeth villiform, without canines; teeth on the palatine bones. Two dorsals; the first with seven, the anal fin with three spines. Operculum spiniferous; præoperculum with the lower limb entire, and the posterior denticulated; a spine at the angle. Præorbital nearly entire. Pyloric appendages?

Philippines.

1. Cnidon chinensis.

Müll. & Trosch. l. c.

D. 7 | $\frac{1}{13}$ A $\frac{3}{9}$.

Manilla.

7. PSAMMOPERCA.

Labrax, sp., *Cuv. & Val.* ii. p. 83.
Psammoperca, *Richardson, Voy. Erebus & Terror, Fishes,* p. 116, and *Ichthyology,* p. 275.

Seven branchiostegals. Teeth on the vomer and palatine bones crowded, granular; no canine teeth; tongue smooth. Two dorsals, slightly continuous, moving in a scaly sheath; the first with eight, the anal with three spines. Operculum with a small, præoperculum with a strong spine, the latter with an entire lower limb. Scales rather large.

East Indian and Australian seas.

1. Psammoperca waigiensis.

Labrax waigiensis, *Cuv. & Val.* ii. p. 83; *Bleeker, Natuurk. Tydschr. Nederl. Ind.* ii. p. 479; *Lesson, Voy. Coq. Zool.* 237.
Psammoperca datnioides, *Richardson, Voy. Erebus & Terror, Fishes,* p. 116. pl. 57. f. 1, 2.
—— waigiensis, *Bleeker, l. c.* v. p. 177.

$$\text{D. } 8 \left| \tfrac{1}{12\text{–}13}. \quad \text{A. } \tfrac{3}{9}. \quad \text{L. lat. } 50\text{–}55. \right.$$

Height of body one-fourth of total length. Hinder edge of præoperculum denticulated, a long spine at the angle.

Australia; Waigiou.

a. Adult: stuffed. Australia.
b. Half-grown: stuffed. Victoria, Australia. Voyage of H.M.S. Herald.
c. Adult: skin. China. From Mr. Warwick's Collection.

2. Psammoperca macroptera.

$$\text{D. } 8 \left| \tfrac{1}{13}. \quad \text{A. } \tfrac{3}{13}. \right.$$

Height of the body one-third of the total length; præorbital and suborbital arch strongly serrated; hinder edge of præoperculum serrated, a triangular spine at the angle.

a. Dried. Victoria, Australia. Voyage of H.M.S. Herald.

The specimen upon which I found this new species shows very well the characters of the genus, and the peculiarities by which it is distinguished from the only other species hitherto known; but the scales are partly detached, or spoiled by fat. It is distinguished by the great elevation of the body, by the high third dorsal spine, and the long anal fin.

The length of the *head* is $4\frac{2}{5}$ in the total; it is compressed, the interspace between the eyes being one-sixth only of the length of the head, or rather more than one-half the diameter of eye. The snout equals in length that diameter, and is laterally covered by the præorbital, which widens above, and is furnished by strong spinous teeth beneath, directed backwards; this serrature becomes finer on the suborbital arch. The upper maxillary is styliform, and forms posteriorly a triangular plate; it does not appear to reach the middle of the eye. The eye is placed high up the side, and does not interfere with the upper outline of the head; its diameter is nearly one-fourth of the length of the head. The operculum has a somewhat rounded posterior angle, without distinct point; the præoperculum is finely serrated along the posterior limb, and armed with a triangular and keeled spine of moderate size at the angle; the lower limb has no denticulation whatever.

The greatest depth of the *body* is between the origins of the second dorsal fin and the anal, the profile rising steeply from the occiput to the highest point; the tail (without caudal). behind the end of the dorsal, is as high as long.

The third spine of the *dorsal fin* is very long, one-sixth of the total length; the first is small; the second shorter than one-half of the third; the fourth, fifth and sixth rapidly decrease in length; the seventh and eighth are short, and inserted between both dorsals. The first spine of the second dorsal is a little longer, one-half of the height of the fin. The rays are nearly equal in length, much shorter than the spinous part, and form a rounded fin. *Caudal* rounded, with eighteen rays. The *anal fin* resembles in shape the soft dorsal, but its base is longer, and the longest ray is somewhat higher. The spines are of moderate strength; the second is rather longer than the third, and two-thirds the length of the longest ray. The *pectoral* and *ventral* fins are nearly equal in length; the latter do not reach to the vent; their spine equals the fifth of the dorsal.

	inches.	lines.
Total length	5	6
Height of the body	1	10
Length of the head	1	4
Interspace between the eyes	0	$2\frac{1}{2}$
Diameter of the eye	0	4
Length of the third dorsal spine	0	11
——— of the fifth dorsal ray	0	6
——— of the second anal spine	0	4
——— of the seventh anal ray	0	$6\frac{1}{3}$
——— of the pectoral fin	0	8

8. PERCALABRAX.

Labrax, sp., *Cuv. & Val.* ii. p. 85.
Percalabrax, *Temm. & Schleg. Faun. Japon.* p. 2.
Lateolabrax, *Bleek. Verhand. Batav. Genootsch.* xxvi. p. 55.

Seven branchiostegals; pseudobranchiæ developed. All the teeth villiform, without canines, teeth on the palatine bones; tongue smooth. Two dorsals, the first with eleven, the anal fin with three spines. Operculum with two points; præoperculum serrated behind, and with strong spinous teeth beneath; præorbital entire. Scales rather small. Number of pyloric appendages increased (13).

Shores of China and Japan.

1. Percalabrax japonicus.

Labrax japonicus, *Cuv. & Val.* ii. p. 85.
Percalabrax japonicus, *Faun. Japon.* p. 2. pl. 2. f. 1.
Lateolabrax japonicus, *Bleek. l. c.*

$$\text{D. } 11 \Big| \tfrac{1}{13-14}.\quad \text{A. } \tfrac{3}{8}.\quad \text{Cæc. pylor. } 13.\quad \text{Vert. } 16/19.$$

Total length equal to somewhat more than four times the height of body; inferior edge of præoperculum with five spinous teeth, directed forwards. Back greenish grey, with round blackish spots; first dorsal fin spotted.

Chinese and Japanese seas.

a. Adult. China. Presented by J. R. Reeves, Esq.
b. Adult. China. Presented by the East India Company.
c. Adult. China. From the Haslar Collection.
d. Half-grown. China.
e. Young. China. Presented by the East India Company.
f. Young. Chusan. Presented by the East India Company.
g. Young. Chusan. Presented by the East India Company.
h. Adult: stuffed. Japan.
i. Young: stuffed. China. Presented by J. R. Reeves, Esq.
k. Intestines of specimen *b*.

This species is in general appearance allied to *Lates*, exhibiting also a concavity of the upper profile of head; and the tongue is smooth, without teeth; but the *pseudobranchiæ* are as much developed as in the species of *Labrax*.

Skeleton.—The skull is rather flat above, the paroccipital crest not much elevated above the level, not extending beyond the supraoccipital, and acutely pointed behind. The muciferous channels are not, or very moderately, developed, as for instance that between the orbits. The suborbital arch with an interior flat process; the maxillary bone without process, and with divergent straight-lined margins. Operculum with two points, both acute, the upper short, the lower very elongate. The hinder limb of the præoperculum is minutely serrated, the angle and the lower limb bear four or five strong spinous teeth, directed forward; the sub- and inter-operculum are entire. The neural spines of the first ten vertebræ are strong and broad; the first interhæmal is exceedingly strong; the plates between the two bony centres of this bone (between the interhæmal of the first, short anal spine and that of the second, strong one) are not united, forming a deep sheath; it is attached to the hæmals of the seventeenth and eighteenth vertebræ.

9. ACERINA*.

Acerina, *Cuv. Règne Anim.*; *Cuv. & Val.* iii. p. 3.

Seven branchiostegals. All the teeth villiform, without canines; no teeth on the palatine bones or on the tongue. One dorsal with thirteen to nineteen spines, the anal fin with two. Operculum and præoperculum spiniferous. Muciferous channels of the bones of the skull very developed. Scales rather small.

Rivers of the Palæarctic Region.

1. Acerina cernua.

Cernua fluviatilis, *Bellon. Aquat.* p. 291; *Gesner,* pp. 191, 192, 226, *Willughby,* p. 334; *Ray,* p. 144.
Percæ fluviatilis genus minus, *Gesner,* pp. 701, 825.
Piscis Danubii, Schröll German., *Gesner,* p. 29. f. 161.
Porcus fluviatilis, Perca fluviatilis minor, &c., *Gesner,* f. 160 *a.*
Perca minor, Porcus, Porculus, &c., *Schoner.* p. 56.
—— fluviatilis minor, *Aldror.* v. cap. 34; *Jonston,* iii. tit. 3. cap. 2. t. 28. f. .
Danubii incola, Piscis Schröllus, *Aldror.* v. cap. 35.
Scrollus, *Jonston,* iii. tit. 3. cap. 3. t. 28. f. *a* (right hand).
Scrollus danubianus, *Willughby,* p. 335; *Ray,* p. 143.
Goldfisch, *Schwenkf. Theriogr. Siles.* p. 441.
Perca no. 3, *Artedi, Spec.* p. 80.
—— no. 4, *Artedi, Genera,* p. 40.
—— cernua, *Linn.*; *Gronov. Syst. ed. Gray,* p. 112; *Schæffer, Pisc. Bavar. Ratisbonensium Pentas.*; *Bloch,* pl. 53. f. 2; *Meidinger,* t. 3; *Don. Brit. Fishes,* ii. pl. 39; *Turton, Brit. Fauna,* p. 100; *Jenyns, Man.* 334; *Müller, Zool. Dan. Prodr.* 392.
Perca no. 1, *Klein, Hist. Pisc.* v. p. 40.
Duhamel, Pêches, iv. p. 39. pl. 8. f. 1; *Marsigli,* iv. p. 67. tab. 23. f. 2 (Perca no. 2).
Gymnocephalus cernua, *Bl. Schn.* p. 345; *White, Catal. of Brit. Fishes,* p. 12.
Holocentrus post, *Lacép.* iv. p. 357.
Cernua fluviatilis, *Flem. Brit. Anim.* p. 212.
Acerina vulgaris, *Cuv. & Val.* iii. p. 4. pl. 41, vii. p. 448; *Fries och Eckström, Skand. Fisk.* p. 9. t. 1. f. 2; *Yarrell, Brit. Fishes,* i. p. 18; *Cuv. Règne Anim. Ill.* pl. 9. f. 2; *Nordmann in Demidoff, Voy. Russ. Mérid.* iii. p. 368; *Günther, Fische des Neckars,* p. 14.
Acerina cernua, *Günther in Wiegm. Archiv,* 1855, p. 199. pl. 10. f. 1, 2.

D. $\frac{13-15}{12}$. A. $\frac{2}{5-6}$. L. lat. 55–60. Vert. 15/20–21 (22).
Cæc. pylor. 3.

Greenish olive, marbled and spotted with brown; dorsal and caudal fins brown-spotted. Head without scales.

Rivers of England, France, Switzerland, Germany, Sweden, Norway, Russia, Siberia.

a. Adult. Danube. (*gymnothorax.*)
b. Adult. Switzerland. Presented by Prof. Agassiz.

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* Acerina zillii, *Gervais, Ann. Sc. Nat.* 1848, p. 203, does not belong to this genus.—Algiers.

c. Several specimens. Gotha River (Sweden). From Mr. Lloyd's Collection.
d, e. Adult. Europe. Presented by W. Yarrell, Esq.
f. Adult. Europe.
g. Adult: skin: not good state. England.

2. Acerina rossica.

Perca tanaicensis, *Güldenstedt, Nov. Comment. Ac. Petrop.* xix. p. 457. t. 2.
—— acerina, *Pall. Zoogr.* iii. p. 244.
Acerina rossica, *Cuv. & Val.* iii. p. 17, vii. p. 449; *Nordmann in Demidoff, Voy. Russ. Mérid.* iii. p. 369. pl. 2. f. 2.

D. $\frac{17-19}{12-14}$. A. $\frac{2}{5-7}$. L. lat. 55. Vert. 40. Cæc. pylor. 3.

Brown, spotted with black.
Russian rivers falling into the Black Sea.

3. Acerina schrætzer.

Schraitser Ratisbonensis, *Willughby*, p. 335; *Ray*, p. 144.
Perca no. 3, *Schraz. Marsigl.* iv. p. 68. t. 23. f. 3.
—— no. 5, *Artedi, Genera*, p. 40.
—— no. 2, *Klein, Hist. Pisc.* v. p. 41.
——, *Gronov. Zoophyl.* no. 289.
—— schrætzer, *Linn. Syst. Nat.* ed. 12. gen. 168. sp. 31; *Bloch*, t. 332; *Schæffer, Pisc. Barar. Ratisbon. Pentas.*; *Meidinger*, t. 2.
Gymnocephalus schrætzer, *Bl. Schn.* p. 345.
Holocentrus schraizer, *Lacép.* iv. p. 347.
Perca danubiensis, *Gronov. Syst. Nat. ed. Gray*, p. 112.
Acerina schraitzer, *Cuv. & Val.* iii. p. 13.

D. $\frac{18-19}{12-13}$. A. $\frac{2}{6-7}$. L. lat. 75. L. transv. $\frac{7-8}{13-14}$. Vert. 15 23. Cæc. pylor. 3.

Brownish olive, with three or four black longitudinal bands dorsal and caudal fins brown-spotted.
Danube.

a, b. Adult. Switzerland. Presented by Prof. L. Agassiz.

10. PERCARINA.

Percarina, *Nordmann in Demidoff's Voyage dans la Russie Mérid.* iii. p. 357.

Seven branchiostegals. All the teeth villiform, without canines; no teeth on the palatine bones; tongue smooth. Two separate dorsals, the first with ten, anal fin with two spines. Muciferous cavities of the bones of the skull much developed. Operculum with one spine; præoperculum denticulated, with simple edge. Scales small.
Dniester.

1. Percarina demidoffii.

Nordmann, l. c., Poiss. pl. 1. f. 1.

D. 10 | $\frac{3}{10-12}$. A. $\frac{2}{9-10}$. L. lat. 34–36.

In habit similar to *Acerina cernua.* Caudalis forked. Yellowish, with round black spots on the back, and with a large brown semilunar blotch on the neck.

Dniester.

11. LUCIOPERCA.

Lucioperca,. *Cuv. Règne Anim.*; *Cuv. & Val.* ii. p. 110.

Seven branchiostegals. Teeth in villiform bands, some on the jaws and on the palatines being longer; teeth on the palatine bones; tongue smooth. Two dorsals, the first with 12–14, the anal fin with two spines. Operculum spiniferous; præoperculum serrated, with a simple edge. Scales small.

Rivers of the Arctic Regions.

1. Lucioperca wolgensis.

Perca wolgensis, *Pall. Voy.* (*Trad. Franç.*) p. 99. pl. 8; *Linn. Gmel.* p. 1309; *Bl. Schn.* p. 91.
Centropomus sandat, var., *Lacép.* iv. p. 263.
Perca asper, *Pall. Zoogr. Ross.* iii. p. 247.
Lucioperca wolgensis, *Cuv. & Val.* ii. p. 117, vii. p. 441; *Nordmann in Demidoff, Voy. Russ. Mérid.* iii. p. 363. pl. 1. f. 2; *Günther, Wiegm. Arch.* 1854, p. 210.

D. 13 | $\frac{1}{22}$. A. $\frac{2}{9-10}$.

Operculum with a rather obtuse and flat point behind; crown, operculum, præ- and suboperculum covered with scales; 80–85 transverse rows of scales; three cæca pylorica; no large black spot on the posterior part of the first dorsal fin.

Rivers of Southern and Asiatic Russia.

2. Lucioperca americana.

Lucioperca americana, *Valenciennes*, ii. p. 122. pl. 16; *Kirtland, Zool. Ohio*, p. 19, and *Bost. Journ.* iv. p. 237. pl. 9. f. 2 (bad); *Rich. Faun. Bor.-Amer., Fishes*, pp. 10 & 14; *Dekay, New York Fauna, Fishes*, p. 17. pl. 50. f. 163; *Agass. Lake Super.* p. 294.

D. 14 | $\frac{1}{19-21}$. A. $\frac{2}{13}$.

Operculum with a strong acute spine behind; occiput, operculum, præ- and suboperculum covered with scales; 100 transverse rows of scales; three cæca pylorica; a large black spot on the posterior part of the first dorsal fin.

Canada; United States.

a. Large specimen: stuffed. Albany River. Presented by Sir J. Richardson.

b, c. Adult: stuffed. Albany River. Presented by Sir J. Richardson.
d, e. Adult: stuffed. Albany River. Presented by the Hudson's Bay Company.
f. Large specimen: skin. Albany River.
g, h. Half-grown and young: skins. New York. From Dr. Parnell's Collection.

3. Lucioperca sandra.

Lucioperca (Schilus), *Gesner*, f. 176 *b*; *Schonev.* p. 43; *Willughby*, p. 293; *Ray*, p. 98; *Marsigli, Danub.* iv. t. 22. f. 2.
Schilus seu Nagemulus, *Aldrov.* v. cap. 59; *Jonston*, iii. c. 7. t. 30. f. 15.
Perca, sp. 2, *Artedi, Genera*, p. 39, and *Species*, p. 76 (classical description); *Gronov. Zoophyl.* no. 299; *Klein, Hist. Pisc.* v. p. 36. pl. 7. f. 3.
—— lucioperca, *Linn. Syst. Nat.* p. 1308; *Gronov. Syst. ed. Gray*, p. 115; *Schæffer, Pisc. Bavar. Ratisbon. Pentas.*; *Bloch, Fische Deutschl.* t. 51; *Bloch, Schneid.* p. 83; *Meidinger, Pisc. Austr.* t. 1; *Pall. Zoogr. Rosso-As.* iii. p. 246; *Shaw, Zool.* v. p. 547.
Centropomus sandat, *Lacép.* iv. pp. 248, 255.
Lucioperca sandra, *Cuv. Règne Anim.*; *Cuv. & Val.* ii. p. 110. pl. 15; *Cuv. Règne Anim. Ill. Poiss.* pl. 7 *a*. f. 2; *Nordmann in Demidoff, Voy. Russ. Mérid.* iii. p. 362; *Günther in Wiegm. Arch.* 1855, p. 205.

$$\text{D. } 13\ (14) \left| \frac{1-2}{21-22}. \quad \text{A. } \frac{2}{11-12}. \right.$$

Operculum with a rather obtuse and flat point behind; crown, operculum and suboperculum with a few scales; more than 100 transverse rows of scales; six cæca pylorica; no large black spot on the posterior part of the first dorsal fin.

Large rivers of the European Continent.

a. Adult. Lake of Ladoga.
b. Adult. Switzerland. Presented by Prof. Agassiz.
c–e. Half-grown. Sweden.
f. Large specimen: stuffed. Europe. Mr. Yarrell's Collection.

4. Lucioperca marina.

Perca labrax, *Pall. Zoogr.* iii. p. 243 (numbers of the fins wrong).
Lucioperca marina, *Cuv. & Val.* ii. p. 120; *Eichw. Zool. Spec.* iii. p. 82.

D. 14 | 23. A. 14.

Both the dorsal fins continuous; parts of the upper surface of the head, the opercles, and cheeks scaly. Dorsal and caudal fins spotted.

Caspian and Black Seas.

5. Lucioperca canadensis.

Lucioperca canadensis (*C. H. Smith*), *Griff. Anim. Kingd.* x. pl. 7. p. 275. pl. 68. f. 221; *Richardson, Faun. Bor.-Amer., Fishes*, p. 11.

$$\text{D. } 12 \left| \frac{1}{17}. \quad \text{A. } 12. \right.$$

Operculum with a spine behind, and with four acute spines on the under margin. Lateral line? Cæca? First dorsal with three rows of large round black spots, the second with four streaks of the same colour.

Canada (Quebec).

6. **Lucioperca grisea.**

Dekay, New York Fauna, Fishes, p. 19.

$$\text{D. } 14 \,\Big|\, \frac{2}{17\text{–}18}. \quad \text{A. } \frac{2}{11\text{–}12}.$$

Operculum with an acute spine behind, above and beneath which is a very small one; crown partly, operculum, præ- and suboperculum entirely covered with scales; 105 transverse rows of scales; seven cæca pylorica. All the fins black-spotted.

Fresh waters of the Northern parts of the United States.

a. Adult. Ohio. From Mr. Frank's Collection as *Perca americana*.
b. Intestines of the same.
c. Adult: skin. Ohio. From Dr. Parnell's Collection.

12. PILEOMA.

Pileoma, *Dekay, New York Fauna, Fishes*, p. 16.

Six branchiostegals. All the teeth minute, villiform, without canines; teeth on the palatines and on the vomer. Operculum with a spine, præoperculum entire. Two separate dorsals, the first with fourteen or fifteen spines; spines of the anal indistinct. Scales of moderate or rather small size. No air-bladder.

Fresh waters of North America.

1. **Pileoma semifasciatum.**

Pileoma semifasciata, *Dekay, l. c.* pl. 50. f. 162.
? —— zebra, *Agass. Lake Super.* p. 308. pl. 4. f. 4.

D. 14 | 15–16. A. 10.

The height of the body is one-sixth of the total length, the length of the head one-fifth; the interspace between the eyes is nearly as broad as their diameter long. Body with narrow black cross-bars, alternately longer and shorter.

a, b. Adult: skins. Lake Erie. From Dr. Parnell's Collection.
c. Adult: skins. Ohio Canal. From Dr. Parnell's Collection.

2. **Pileoma carbonarium.**

Baird & Girard, Proc. Ac. Nat. Sc. Philad. 1853, p. 387.

D. 15 | 13. A. 11.

The length of the head one-fifth of the total. Body with transverse bars of black a black spot at the base of the caudal, the latter barred; base of dorsals, anal, and ventrals black. (*B. & G.*)

Rio Salado (Texas)

13. BOLEOSOMA*.

Boleosoma, *Dekay, New York Fauna, Fishes*, p. 20.

Six branchiostegals. Minute card-like teeth, without canines; teeth on the palatine bones; tongue smooth. Two dorsals, the first with nine or ten feeble, the anal fin with indistinct spines. Operculum with a single point, præoperculum smooth. Scales moderate. No air-bladder.

Fresh waters of the United States.

1. Boleosoma tessellatum.

Dekay, l. c. pl. 20. f. 57.

$D. 9 \mid 14. \quad A. \frac{2}{8}.$

Nape depressed, contracted; a deep furrow between the eyes; caudalis truncated. Brownish, with oblong quadrate spots on the back and sides.

Rivers of New York.

2. Boleosoma lepidum.

Baird & Girard, Proc. Ac. Nat. Sc. Philad. 1853, p. 388.

$D. 9 \mid 11. \quad A. \frac{2}{6}.$

The head forms one-fourth of the total length. Reddish, with indistinct transverse blackish bars; base of the scales black; fins immaculate; a vertical black spot beneath the eye. (*B. & G.*)

Upper tributaries of the Rio Nueces, Texas.

3. Boleosoma maculatum.

Agass. Lake Super. p. 305. pl. 4. f. 3.

D. 9 | 12. A. 11.

The length of the head is one-fifth of the total; the pectoral fin rather shorter. Irregularly spotted on the back and the sides· dorsal and caudal fins barred transversely with black. (*Ag.*)

Pic (Lake Superior).

This fish may prove to be the same species as *Boleosoma tessellatum.*

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* Agassiz (Lake Super. p. 299) refers to this genus *Etheostoma olmstedi*, Storer (Bost. Journ. iv. p. 61. pl. 5. f. 2). Agassiz also gives the diagnoses of two other genera, closely allied to the above, *Etheostoma* and *Pœcilosoma.* All these small fishes from North America are too little known to admit of their separation into a family (*Etheostomata.* Ag.) *Pileoma* has a great resemblance to *Lucioperca.*

14. **ASPRO.**

Aspro, *Cuv. Règne Anim.*: *Cuv. & Val.* ii. p. 188.

Body elongated, cylindrical; snout thick, projecting beyond the mouth; mouth situated at the lower side. Seven branchiostegals. All the teeth villiform without canines; teeth on the palatine bones; tongue smooth. Two separate dorsals; anal fin with a single spine. Operculum spiniferous, præoperculum serrated; præorbital entire. Scales small.

Rivers of the European Continent.

1. **Aspro vulgaris.**

Asper pisciculus, *Rondel.* ii. p. 207; *Gesner,* pp. 403, 478; *Aldrov.* v. cap. 28; *Jonst.* iii. c. ii. t. 26. f. 18; *Willughby,* p. 294; *Ray,* p. 98; *Marsigli, Danub.* iv. pl. 9. f. 2, 3. pp. 27, 28.
Gobius asper, *Gesner (ed. Francof.),* f. 162 *b.*
Perca, sp. 3, *Artedi, Genera,* p. 40.
—— asper, *Linn. Syst.* i. p. 1309; *Bloch,* t. 107. f. 1, 2; *Schæffer, Pisc. Bavar. Ratisb. Pentas.*; *Gronov. Zoophyl.* p. 92. no. 303, and *Syst. ed. Gray,* p. 115; *Hartm. Ichthyol. Helvet.* p. 68; *Shaw, Zool.* iv. p. 551.
Dipterodon asper, *Lacép.* iv. p. 170.
Aspro vulgaris, *Cuv. & Val.* ii. p. 188. pl. 26; *Cuv. Règne Anim. Ill.* pl. 6. f. 2; *Nordmann in Demidoff's Voy. Russ. Mérid., Poiss.* p.

$$\text{D. } 8 \left| \frac{1}{11\text{–}12}. \quad \text{A. } \frac{1}{11\text{–}12}. \right.$$

Back brownish, sides with a yellowish cast, four or five dark transverse bands.

Rhone; Danube.

a. Adult. Danube.
b. Adult. Switzerland. Presented by Prof. Agassiz.

2. **Aspro zingel.**

Gesner, Paralip. p. 19; *Marsigli, Danub.* iv. pl. 9. f. 3; *Klein, Hist. Pisc.* v. p. 28.
Perca zingel, *Linn.* i. p. 1310; *Schæffer, l. c.*; *Bloch,* t. 106; *Meidinger, Pisc. Austr.* t. 4.
Aspro zingel, *Cuv. & Val.* ii. p. 194.

$$\text{D. } 13\text{–}15 \left| \frac{1}{18\text{–}20}. \quad \text{A. } \frac{1}{11\text{–}13}. \quad \text{L. lat. } 95. \quad \text{L. transv. } \frac{7}{13\text{–}14}. \right.$$

Back greenish brown, sides with a yellowish cast; irregularly spotted and marbled with dark brown, across the back four more or less conspicuous bands.

Danube.

a. Large specimen. Europe. Presented by the Zoological Society.
With the formula: $\text{D. } 15 \left| \frac{1}{19}. \quad \text{A. } \frac{1}{11}. \right.$

15. ETELIS.

Etelis, *Cuv. & Val.* ii. p. 127.

Seven branchiostegals. Teeth in villiform bands; canine teeth in the jaws, those of the palatines being equal; tongue smooth. Two dorsals, the first with nine, the anal fin with three spines. Caudalis deeply notched. Operculum spiniferous; præoperculum with a simple edge, indistinctly denticulated. Scales moderate.

Seas of the Seychelles and Isle de France.

1. **Etelis carbunculus.**

Cuv. & Val. ii. p. 127.

D. $9 \mid \frac{1}{11}$. A. $\frac{3}{8}$. L. lat. 50. L. transv. 6/14.

Height of the body one-fourth of the total length; præoperculum minutely denticulated. Bright red in life, with golden shining lines along the rows of scales.

Seychelles; Isle de France.

a. Very large specimen: stuffed. Isle de France.

16. CENTROPOMUS.

Centropomus, sp., *Lacépède, Hist. Nat. Poiss.* iv. p. 248.
Centropomus, *Cuv. Règne Anim.*; *Cuv. & Val.* ii. p. 102.

Seven branchiostegals. All the teeth villiform, without canines; teeth on the palatine bones, tongue smooth. Two distinctly separated dorsals, the first with eight, the anal fin with three spines, the second of which is exceedingly long. Operculum without spinous point; præoperculum with two denticulated edges. Scales moderate.

Neotropical part of the Atlantic Ocean.

1. **Centropomus undecimalis**

Camuri, *Marcgrave*, p. 166.
Sciæna undecimalis, *Bloch*, t. 303
Platycephalus undecimalis, *Bl. Schn.* p. 59.
Centropomus undecim-radiatus, *Lacép.* iv. p. 267.
—— undecimalis, *Cuv. & Val.* ii. p. 102. pl. 14; *Schomb. Hist. Barbad.* p. 665, and *Reis. Brit. Guian.* iii, p. 620; *Ramon de la Sagra, Hist. Cub. Poiss.* p. 9.
Perca loubina, *Lacép.* iv. pp. 397, 418, 421.
Sphyræna aureoviridis, *Lacép.* v. p. 324. pl. 9. f. 2 (bad).

D. $8 \mid \frac{1}{10}$. A. $\frac{3}{6}$.

Silvery white, back greenish, a brownish band along the lateral line. Height of the body one-fifth of the total length.

Atlantic shores of Tropical America. (Lima?)

a. Adult. South America.

b. Half-grown: not good state. South America.
c, *d*. Young. South America. Presented by Sir R. Schomburgk.
e. Adult: not good state. Bahia. From M. Parzudaki's Collection.
f. Fine specimen. Pernambuco. Presented by J. P. G. Smith, Esq.
g. Adult: bad state. Surinam.
h, *i*. Half-grown: not good state. Demerara. Presented by Dr. Hancock.
k, *l*. Young. British Guiana. Presented by Sir R. Schomburgk.
m. Half-grown. West Indies.
n. Young. West Indies.
o, *p*. Adult: fine specimens. St. Domingo. From Mr. Cuming's Collection.
q–s. Adult and young: skins. Jamaica. From Dr. Parnell's Collection.
t. Adult. America. From the Haslar Collection.
u. Half-grown. America. From the Haslar Collection.

17. NIPHON.

Niphon, *Cuv. & Val.* ii. p. 131.

Seven branchiostegals. All the teeth villiform, without canines; teeth of the palatine bones?; tongue?. Two dorsals, the first with twelve, the anal fin with three spines. Operculum and præoperculum with very long and strong pointed spines, the latter with strong teeth at the lower limb. Scales very small.

Japanese Sea.

1. Niphon spinosus.

Cuv. & Val. ii. p. 131. pl. 19; *Faun. Japon.* p. 1. pl. 1. f. 1.

$$D. 12 \,\Big|\, \frac{1}{11}. \quad A. \frac{3}{7}.$$

Head elongate, nearly one-third of total length; spine of the præoperculum as long as its inferior limb. Coloration uniform.

Japanese Sea.

a. Adult: stuffed. Japan.
b. Half-grown: stuffed. Japan.

18. ENOPLOSUS.

Enoplosus, *Lacépède, Hist. Nat. Poiss.* iv. p. 541; *Cuv. & Val.* ii. p. 133.

Body and vertical fins greatly elevated. Seven branchiostegals. All the teeth villiform, without canines; teeth on the palatine bones and on the tongue. Two dorsals. Operculum without spine; præoperculum serrated, and with spinous teeth at the angle. Scales moderate.

Australian Seas.

1. Enoplosus armatus.

Chætodon armatus, *White, Voy. N. S. Wales*, pl. 39. f. 1.
Enoplosus whitii, *Lacép.* iv. p. 541.
—— armatus, *Cuv. & Val.* ii. p. 133. pl. 20.

$$\mathrm{D.}\ 7 \Big| \frac{1}{14\text{–}15}.\quad \mathrm{A.}\ \frac{3}{15}.\quad \text{Cæc. pylor. 15.}\quad \text{Vert. 25.}$$

Upper profile of head very concave; body one-half as high as long, much compressed; all the fins, except caudal, much elongate and pointed. White, with eight black transverse bands.

Coast of New South Wales.

a. Adult. Sydney. Presented by Lieut. Alexander Smith, R.N.
b. Adult. Sydney. Presented by Mr. Williams.
c–e. Adult. Sydney. From the Haslar Collection.
f. Several specimens. Australia. From the Haslar Collection.
g. Adult. Australia.
h. Adult: stuffed. Australia. From Mr. Warwick's Collection.
i. Adult: stuffed. Australia.
k. Adult: skin. Australia. From Mr. Gould's Collection.
l. Adult: skin. Australia.
m. Half-grown: skin. Australia. From Mr. Gould's Collection.

Second Group. SERRANINA.

(For characters, see page 57.)

19. APRION.

Aprion, *Cuv. & Val.* vi. p. 543.

Seven branchiostegals. Teeth villiform, with canines in both jaws; teeth on the palatine bones; tongue smooth. One dorsal with ten spines, the anal fin with three. Operculum spiniferous; præoperculum entire, with a single ridge. Scales moderate.

Coasts of the Seychelles.

1. Aprion virescens.

Cuv. & Val. vi. p. 544. pl. 168.

$$\mathrm{D.}\ \frac{10}{11}.\quad \mathrm{A.}\ \frac{3}{8}.\quad \text{L. lat. 50.}\quad \text{L. transv. 20.}$$

The height of the body is one-fifth of the total length, the length of the head one-fourth; the diameter of the eye is one-fourth of the length of the head. The lower jaw rather prominent; suprascapula denticulated. Caudalis deeply forked. Greenish, with a black spot between the seventh and ninth dorsal spines. (*Val.*)

Seychelles.

20. APSILUS.

Apsilus, *Cuv. & Val.* vi. p. 548.

Seven branchiostegals. All the teeth villiform, without canines; teeth on the palatine bones; tongue with minute teeth. One dorsal with ten spines, the anal fin with three. No serratures or spines on the bones of the skull. Scales rather small.

Cape Verde.

1. Apsilus fuscus.

Cuv. & Val. vi. p. 549. pl. 168 *b*.

D. $\frac{10}{10}$. A. $\frac{3}{8}$. L. lat. 65.

The height of the body is one-fourth of the total length, the length of the head one-fifth; the diameter of the eye is $4\frac{1}{2}$ in the latter, and $1\frac{1}{2}$ in the distance from the end of the muzzle; the upper maxillary bone reaching only to the posterior half of the distance mentioned. Caudal very deeply forked; the dorsal spines feeble, the fourth the longest. Brown; dorsal marbled with darker. (*Val.*)

Porto Praya (Cape Verde).

21. CENTROPRISTIS*.

Centropristes, sp., and Serranus, sp., *Cuv. Règne Anim.*; *Cuv. & Val.* ii. p. 241 &c., iii. p. 36.
Centropristes, *Brisout de Barneville, Rev. Zool.* 1847, p. 130.
Diplectrum and Centropristes, *Holbr. Ichth. S. Carol.* pp. 32, 42.

Seven branchiostegals. Teeth villiform, with very small canines in both jaws; teeth of the vomer in an angular band or a short triangular patch; teeth on the palatine bones; tongue smooth. One dorsal with the formula $\frac{10}{\text{12 or minus 12}}$; the anal fin with $\frac{3}{7\,(6)}$. Operculum spiniferous; præoperculum serrated, sometimes with a projecting rounded angle. Scales moderate or rather small.

American parts of the Atlantic; Mediterranean; Japanese Sea.

1. Centropristis bivittatus.

Serranus bivittatus, *Cuv. & Val.* ii. p. 241.

D. $\frac{10}{12}$. A. $\frac{3}{7}$.

Teeth of the angle of præoperculum strong, and produced into a small bundle; its posterior limb very obliquely descending backwards; caudalis slightly notched. On each side a brown longitudinal band above the lateral line, another beneath; head with some blue streaks; on the hinder half of dorsal fin two parallel series of square violet spots.

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* 1. Perca philadelphica, *Linn. Syst. Nat.* p. 1314; *Bl. Schn.* p. 91.—Philadelphia.
2. Centropristis nebulosus, *Castelnau, Anim. nouv. ou rares de l'Amér. du Sud, Poiss.* p. 5. pl. 1. f. 4.—Rio de Janeiro.
3. Serranus flavescens, *Cuv. & Val.* vi. p. 506.—Martinique.
[Centropristes gigas, *Owen*, belongs to the genus *Oligorus*.]

Martinique; Cuba.

2. Centropristis radialis.

Serranus radialis, *Quoy & Gaimard, Voy. de Freyc.* p. 316; *Cuv. & Val.* ii. p. 243.

$$D. \frac{10}{12}. \quad A. \frac{3}{7}.$$

Angle of præoperculum enlarged, rounded, striated, with long spinous teeth; its posterior limb obliquely descending backwards, finely denticulated; caudalis slightly notched. On each side three longitudinal series of large irregular blotches; anterior part of dorsal fin with a longitudinal violet band; posterior half and caudalis spotted.

Coast of Brazil.

a. Adult. America. From the Haslar Collection.
b. Large specimen. Bahia. Purchased of M. Parzudaki.
c. Large specimen. Old Collection.
d. Adult: bad skin. America. Old Collection.

3. Centropristis radians.

Serranus radians, *Quoy & Gaim. Voy. de Freyc., Poiss.* pl. 58. f. 2.
—— irradians, *Cuv. & Val.* ii. p. 244; *Castelnau, Anim. nouv. ou rares de l'Amér. du Sud, Poiss.* p. 3.

$$D. \frac{10}{12}. \quad A. \frac{3}{7}.$$

Angle of præoperculum enlarged, rounded, with about eight long spinous teeth; lower half of its posterior limb provided with equally strong denticulations, directed upwards; upper half finely serrated. Body with eight to thirteen transverse streaks, crossed by four to six longitudinal bands; cheeks with some bluish streaks; dorsal fin with longitudinal stripes; caudalis spotted.

Coast of Brazil; Montevideo.

4. Centropristis fascicularis.

Serranus fascicularis, *Cuv. & Val.* ii. p. 245. pl. 30, ix. p. 431.
Diplectrum fasciculare, *Holbr. l. c.* pl. 5. f. 1.

$$D. \frac{10}{12}. \quad A. \frac{3}{7}.$$

Præoperculum posteriorly with two prominent groups of very strong teeth; its inferior limb entire. Caudalis with rather elongate lobes. Body with dark cross-bands and with five or six bluish longitudinal lines; dorsalis with longitudinal stripes.

Coast of Brazil; Charleston.

5. Centropristis conceptionis.

Serranus conceptionis, *Cuv. & Val.* ii. p. 246; *Less. Voy. Coq. Zool.* ii. p. 236; *Gay, Chile, Zool.* ii. p. 148.

D. $\frac{10}{12}$. A. $\frac{3}{6}$.

Only six soft rays in the anal fin; angle of præoperculum produced posteriorly, with stronger teeth; both its limbs serrated. Body uniform brownish; dorsal fin marbled in front, striped behind.

Conception.

a. Adult. From the Haslar Collection.

6. Centropristis hepatus.

?῞Ηπατος (jecorinus), *Arist. Hist. Anim.* ii. 17.
Sachettus Venetorum, *Willughby,* iv. c. 30; *Ray,* p. 139.
Labrus no. 2, *Artedi, Synon.* p. 53 (synon. pars).
Labrus hepatus (part.), *L. Gm.* p. 1283; *Bl. Schn.* p. 245; *Lacép.* iii. pp. 424, 456.
—— adriaticus, *Brünnich, Spol. Mass.* p. 98. no. 11; *Gm. Syst.* p. 1297; *Bl. Schn.* p. 262.
Holocentrus striatus, *Bloch,* t. 235. f. 1; *Bl. Schn.* p. 314.
Lutjanus adriaticus, *Lacép.* iv. p. 222.
Holocentrus triacanthus, *Lacép.* iv. p. 376.
—— siagonotus, *De la Roche, Ann. Mus.* xiii. p. 352. pl. 22. f. 8.
—— hepatus, *Risso, Ichthyol. Nice,* p. 292.
Serranus hepatus, *Cuv. & Val.* ii. p. 231; *Faun. Japon.* p. 5; *Guichen. Explor. Sc. Algér. Poiss.* p. 34.

D. $\frac{10}{12\,(11)}$. A. $\frac{3}{7}$. L. lat. 42.

Caudal fin truncated; præoperculum with finely serrated limbs and a rounded angle. Body with five black cross-bands; a black blotch on the first soft rays of the dorsal fin.

Mediterranean; Cape of Good Hope.

a, b. Adult and young. Dalmatia.
c. Fine specimen. Mediterranean. From the Haslar Collection.
d, e. Adult: not good state. From the Haslar Collection.
f. Adult. From the Old Collection.
g, h. Adult.

7. Centropristis luciopercanus.

Serranus luciopercanus, *Poey, Memor. Cuba,* p. 56. lam. 9. f. 1.

D. $\frac{10}{12}$. A. $\frac{3}{7}$. L. lat. 70. L. transv. 7/20. Cæc. pylor. 2. Vert. 10/14.

The lower jaw more elongate and prominent than in the other species; the diameter of the eye is one-fourth of the length of the head; præorbital projecting in front, partly covering the jaw-bones. Præoperculum serrated, without projecting angle; interoperculum entire. Caudalis forked. Reddish olive, with many irregular dark transverse spots. (*Poey.*)

Cuba

8. Centropristis tabacarius.

Centropristes tabacarius, *Cuv. & Val.* iii. p. 44; *Ramon de la Sagra, Hist. Cub. Poiss.* p. 28.
Serranus jacome, *Poey, Memor. Cuba,* 1851, p. 57. lam. 2. f. 1.

D. $\frac{10}{12}$. A. $\frac{3}{7}$. L. lat. 70. Cæc. pylor. 5. Vert. 10/14.

Præoperculum very finely serrated; the distance between the eyes is $\frac{3}{4}$ths of the diameter. Reddish brown; a large white spot on the lateral line beneath the first seven spines, a smaller one above the lateral line beneath the first ray; a third immediately beneath the last four rays of the dorsal.

Caribbean Sea.

a. Half-grown. West Indies. Presented by the Zoological Society.
b. Adult: skin. West Indies. From Mr. Scrivener's Collection.

9. Centropristis præstigiator.

Serranus præstigiator, *Poey, Memor. Cuba,* 1851, p. 58. lam. 2. f. 2.

D. $\frac{10}{12}$. A. $\frac{3}{7}$. L. lat. 70. L. transv. 8/24. Cæc. pylor. 5. Vert. 10/14.

Præorbital not projecting; operculum with three spines; præoperculum serrated, without projecting angle; sub- and inter-operculum entire. Caudalis emarginate. Brown, with irregular black transverse bands and spots; belly yellowish.

Cuba.

a, b. Adult: not good state. From the Haslar Collection.

10. Centropristis brasiliensis.

Brisout de Barneville, Rev. Zool. 1847, p. 131.

D. $\frac{10}{12}$. A. $\frac{3}{7}$. L. lat. 50.

Præoperculum rounded throughout, serrated; operculum with three flat points; the length of the head is two-fifths of the length of the trunk (without caudalis); the distance between the eyes is one-half of the diameter. Brown, with indistinct cross-bands; dorsalis with three black spots.

Coast of Brazil; Caribbean Sea; St. Helena.

a. Adult: stuffed. St. Helena. Presented by General Hardwicke.

11. Centropristis phœbe.

Serranus phœbe, *Poey, Memor. Cuba,* 1851, p. 55. pl. 2. f. 3.

D. $\frac{10}{12}$. A. $\frac{3}{7}$. L. lat. 48. L. transv. 5/12.

Præorbital not projecting; operculum with two spines; præoperculum serrated behind, and at a part of the lower limb, without projecting angle; sub- and inter-operculum entire. Caudalis emarginate; pectorals extending to a white cross-band at the side of the belly; ground-colour brownish.

Cuba.

a. Adult. South America. Presented by Sir R. Schomburgk.
b. Adult. South America. Presented by Sir R. Schomburgk.
c, *d*. Adult: skins. West Indies. Purchased of Mr. Scrivener.

12. **Centropristis psittacinus.**

Serranus psittacinus, *Valenc. Voy. Vénus, Zool. Poiss.* p. 299. pl. 1. f. 1.

D. $\frac{10}{12}$. A. $\frac{3}{7}$. L. lat. 53.

Operculum with three spines; præoperculum rounded; the diameter of the eye one-fifth of the length of the head. Green; the upper parts of the head and back red. Two large spots on the tail, and six smaller ones along the lower part of the body and tail, black, with red edge. (*Val.*)

Galapagos Archipelago.

13. **Centropristis atrobranchus.**

Cuv. & Val. iii. p. 45.

D. $\frac{10}{12}$. A. $\frac{3}{7}$.

Operculum with a single spine; præoperculum angular. Yellowish, with five brown vertical bands; a black spot at the gill-opening beneath the operculum, another on the dorsal fin above the second vertical band. Dorsal fin with small round spots.

Coast of Brazil.

14. **Centropristis atrarius.**

Perca atraria, *Linn. Syst. Nat.* i. p. 485, and *Linn. Gm.* i. p. 1314; *Gronov. Syst. ed. Gray*, p. 111; *Bl. Schn.* p. 88.
Schöpff in Schrift. der Naturforsch. Freunde Berlin, viii. p. 164.
Coryphæna nigrescens, *Bl. Schn.* p. 297.
Perca varia, *Mitchill, Report*, p. 10.
Lutjanus trilobus, *Lacép.* iv. p. 246.
Centropristes nigricans, *Cuv. & Val.* iii. p. 37. pl. 44; *Règne Anim. Illustr. Poiss.* pl. 9 *a*. f. 1; *Dekay, New York Fauna*, p. 24. pl. 2. f. 6 (5 in text).
—— rufus, *Cuv. & Val.* iii. p. 47.
—— atrarius, *Holbr. l. c.* p. 42. pl. 7. f. 2.

D. $\frac{10}{11}$. A. $\frac{3}{7}$. L. lat. 50. Vert. 10/14. Cæc. pylor. 4 (*Holbr.* 7).

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head one-third; the diameter of the eye is $4\frac{1}{2}$ in the length of the head. Suprascapula denticulated; operculum with two spines; the third dorsal spine rather longer than the following; caudal fin forked, and with the middle rays a little elongate, but generally mutilated. Greyish brown, each scale darker in the centre and on the edge; dorsalis with some lighter bands: in the fresh fish, body with broad, vertical, dark bands.

Atlantic coasts of the United States.

a. Adult. North America. Purchased of Mr. Warwick.
b. Adult: skin. New York. From Dr. Parnell's Collection.
c. Adult: skin. Gronov's original specimen.

Holbrook (*l. c.* p. 46) distinguishes two species, one being found to the north of Cape Hatteras, the other to the south of it. The first, he says, is the fish described by Schöpff, or *Coryphana nigrescens*, Bl., and *Perca varia*, Mitch. The pectoral fin is said to be longer than the ventral in the southern species, and coterminal with it in the northern. Further, the air-bladder is sacculated in the southern (*C. atrarius*, Holbr.), and never in the northern (*C. nigricans*, Holbr.). I have, at present, no opportunity of confirming these observations.

15. **Centropristis hirundinaceus.**

Centropristis hirundinaceus, (*Langsdorf*) *Cuv. & Val.* vii. p. 450; *Faun. Japon.* p. 14. pl. 5. f. 2.

D. $\frac{10}{10}$. A. $\frac{3}{6}$.

Operculum with two spines. Caudalis forked; rose-coloured above; the dorsal rays and spines with brown spots.

Japanese seas.

22. CALLANTHIAS.

Callanthias, *Lowe, Proc. Zool. Soc.* 1839, p. 76, and *Fishes of Madeira*, p. 13.

Six branchiostegals. Teeth villiform, with canines in both jaws; teeth on the palatine bones; tongue smooth. One dorsal, with eleven spines, the anal fin with three. Operculum spiniferous; præoperculum entire. A part of the fins elongate. Scales moderate.

Coasts of Madeira.

1. **Callanthias peloritanus.**

Bodianus peloritanus, *Cocco, Giornale di Scienze per la Sicilia, Palermo*, 1829, p. 138.
Anthias buphthalmos, *Bonap. Faun. Ital., Pesci*, pl. . f. 3.
Callanthias paradisæus, *Lowe, Suppl. Syn. Mad. Fishes, in Proc. Zool. Soc.* 1839, p. 76, and *Fishes of Madeira*, p. 13. t 3 (excellent description).

D. $\frac{11}{10}$. A. $\frac{3}{10}$. L. lat. 22–24. Vert. 11/13. Cæc. pylor. 3.

Muzzle exceedingly short; fourth and fifth soft rays of dorsal fin, and both the lobes of caudal fin, elongate. Back rose-coloured, sides and fins with a yellow tint.

Madeira.

a. Adult: fine specimen. Madeira. Presented by the Rev. R. T. Lowe.

23. ANTHIAS.

Anthias, sp., *Bl. Schn.* p. 303; *Cuv. & Val.* ii. p. 249.
Caprodon, *Temm. & Schleg. Faun. Japon. Poiss.* p. 64.

Seven branchiostegals. Teeth villiform, with canines in both the jaws; teeth on the palatine bones; tongue smooth, or with small teeth. One dorsal, generally with ten spines; the anal fin with three. Caudalis forked, generally one or several of the fins very elongate. Operculum spiniferous, præoperculum serrated. Scales moderate.

Nearly all the seas of the temperate and tropical regions.

In separating these fishes from the true *Serrani*, I apply the larger size of the scales as an absolute character, rather than the upper maxillary bone being covered with scales—the latter character occurring too often in fishes which cannot be separated from the true *Serrani*. Excluding the last four species, which may probably form types of separate genera, we have a very natural group, with the same physiognomy, with rather large scales, and mostly with remarkably developed fins. On the other hand, I am rather inclined to bring the *Serranus creolus* also into this genus, as it has the exterior appearance of *Anthias*; but I am prohibited from doing so by its very small scales, in which and other respects it resembles very much *Apsilus fuscus*.

1. Anthias sacer.

? Ἀνθίας, Αὐλοπίας, *Aristot.* vi. c. 10, 16, 17, ix. c. 2, 37.
Anthiæ prima species, *Rondel.* vi. c. 11. p. 188; *Gesner*, pp. 55, 62, and *Edit. Frankf.* p. 13; *Aldrov.* i. c. 19; *Jonston*, i. cap. 1. t. 16; *Willughby*, p. 325; *Ray*, p. 138.
Labrus, sp. 3, *Artedi*, *Synon.* p. 54.
—— anthias, *Linn. Syst. Nat.* i. p. 1283.
Perca pennanti, *Bloch*, *Schrift. Naturf. Freunde Berlin*, x. pl. 9. f. 1.
Anthias sacer, *Bl.* t. 315; *Bl. Schn.* p. 303; *Cuv. & Val.* ii. p. 250. pl. 31; *Lowe*, *Fishes of Madeira*, p. 19. t. 4.
Lutjanus anthias, *Lacép.* iv. p. 197; *Risso*, *Ichthyol. de Nice*, p. 260.

D. $\frac{10-11}{15}$. A. $\frac{3}{7}$. L. lat. 37.

Third spine of dorsal, ventral, and caudal fins much elongate. Red in life; head with three yellow bands; two bands on the side of occiput, and a series of spots at the base of the dorsal fin brownish green.

Mediterranean; Madeira.

a. Large specimen: not good state. Madeira. Old Collection as *Perca imperator*.
b. Adult: male. Madeira. From the Haslar Collection.
c–e. Adult. Madeira. From the Haslar Collection.
f. Adult. Madeira. Presented by Sir A. Smith.
g. Fine specimen. Madeira. Presented by the Zoological Society.
h. Half-grown. Sicily. Presented by W. Swainson, Esq.

i. Adult. Dalmatia.
k, l. Half-grown. Adriatic. From Mr. Frank's Collection.
m, n. Adult. Europe. Presented by the Zoological Society.
o. Half-grown. Europe. From Mr. Frank's Collection.
p. Half-grown. Europe. From Mr. Frank's Collection.
q. Adult: not good state. Europe. From the Haslar Collection.
r. Adult: very bad state. Europe. Old Collection.
s. Half-grown: stuffed. Europe. From Mr. Yarrell's Collection.

2. Anthias borbonius.

Serranus borbonius, *Cuv. & Val.* ii. p. 263 (not *Quoy & Gaim.*).

D. $\frac{10-11}{17}$. A. $\frac{3}{7}$.

Third spine of dorsal, ventral, and caudal fins much elongate. Angle of præoperculum with three stronger teeth. Greyish, with large brown spots.

Isle de France.

a. Adult. Mauritius. Presented by the Zoological Society.

3. Anthias squamipinnis.

Peters, Wiegm. Archiv, 1855, p. 236.

D. $\frac{10}{18}$. A. $\frac{3}{8}$. L. lat. 44. L. transv. 3/15.

The third dorsal spine filiform; ventrals not elongate; fins covered with rather large scales far beyond the base. Operculum with two strong spines; præoperculum with stronger denticulations at the angle. Red, with a blue line from the orbit to the root of the pectorals. (*Peters.*)

Coast of Mozambique.

4. Anthias asperilinguis. (Plate VIII.)

B. 7. D. $\frac{10}{15}$. A. $\frac{3}{7}$. L. lat. 37. L. transv. 4/17.

Only ventral and caudal fins much elongate; tongue with teeth; præoperculum minutely serrated, with some obsolete denticulations at the angle.

a. Adult. South America. Presented by Sir R. Schomburgk.

Description of the specimen.—The form of the body is rather elevated and compressed, its height being comprised $2\frac{1}{2}$ in the total length (without caudal fin). The head is rather short, with very obtuse and short muzzle; it is one-third of the total length (without caudal); the eye is large, its diameter being much larger than the distance between the eyes or the extent of the snout, and forming nearly one-third of the length of the head. The head is covered all over with ctenoid scales, much smaller than those of the trunk. The cleft of the mouth is very oblique, the upper maxillary bone suddenly widening, and very broad behind, not extending to the vertical from the centre of the eye; the præorbital narrow, half as broad as the maxillary. There is only one small opening of the nostril, situated above the anterior margin of the eye. The crown rounded, convex. The præoperculum exhibits a very fine serrature along the posterior limb, and a rather obtuse angle with some coarse obsolete denticulations, which extend on a part of the lower limb. The sub- and interoperculum are entire. The operculum is provided with three flat, short points, the upper of which is hidden by the scales, the middle broadest and largest, and the lower minute, but conspicuous and immediately beneath the former.

The *dorsalis* commences just above the posterior margin of the operculum; the spinous portion is much lower than the soft, but as long; the spines are rather slender, and become gradually longer from the first to the last; the first is not one-half of the diameter of the eye, the last more than twice as long. The membrane between is deeply notched, and emits behind the tip of each spine a filiform appendage, about half the length of the spine. The anterior part of the spinous portion can be nearly hidden in a scaly sheath. The soft portion is rather elevated, with rounded upper margin and rounded posterior angle; the middle rays are rather longer than the others, the ninth being nearly twice as long as the last spine. The *caudalis* is deeply forked, and each lobe very much elongate and pointed; the longest ray is about half the total length (without caudal); smaller deciduous scales cover a great part of each lobe. The *analis* is even more elevated than the dorsal, without a prominent single ray, and with rounded lower margin. The spines are not very strong, the second rather stronger but shorter than the third, which exceeds in length the last dorsal spine. The *pectoralis* elongate, reaching to the soft portion of the anal, and composed of eighteen rays, the middle of which are longest, the others becoming gradually shorter towards the outer margins of the fin. In the *ventralis* the first and second rays are exceedingly elongate, filiform, and reach nearly to the root of the caudal fin; the three others are very much shorter; the supporting spine is $1\frac{1}{3}$ longer than even the third of the analis.

The *scales* are rather large, nearly twice as high as long, and one of the largest covers about one-fifth of the eye. The lateral line is strongly arched behind the head, runs near the base of the dorsal fin, and is again bent downwards below the posterior end of that fin, forming a straight line from thence along the middle of the tail.

There are several *teeth* deserving the denomination of canines: first, in front of each jaw a pair of rather feeble canines at the ordinary place; secondly, in the upper jaw at the posterior part of the villiform band, behind the front canines, two or three pairs of stronger teeth, nearly as strong as the former; thirdly, on the side of the mandibula one strong curved tooth. The vomerine teeth form a triangular group (not an angular series). In the middle of the tongue there is an oval patch of villiform teeth.

The specimen is rather discoloured; but there is every probability of its having been rose-coloured, with parallel oblique and longitudinal shining golden bands following the series of scales. There are visible on the sides of the head two oblique bands of indistinct colour, one running from the back edge of the orbit across the operculum, the other from below the eye to the inferior part of the operculum.

Length of the specimen 9″.

5. Anthias tonsor.

Serranus tonsor, *Cuv. & Val.* ii. p. 262.

$$D. \frac{10}{12}. \quad A. \frac{3}{6}.$$

Third spine of dorsal, ventral, and caudal fins much elongate. No large teeth on the angle of præoperculum.

Shores of Brazil.

6. Anthias furcifer.

Serranus furcifer, *Cuv. & Val.* ii. p. 264.

$$D. \frac{9}{18}. \quad A. \frac{3}{9}.$$

Only the caudal fin elongate, upper part longer. Reddish, on each side with four small round violet spots; fins not streaked.

Shores of Brazil.

7. Anthias trifurcus.

Perca trifurca, *Linn. Syst. Nat.* i. p. 489.
Lutjanus tridens, *Lacép.* iv. p. 246.
Centropristes tridens, *Cuv. & Val.* iii. p. 43; *Holbr. Ichth. S. Carol.* p. 47. pl. 7. f. 1.

$$D. \frac{10}{11}. \quad A. \frac{3}{10}.$$

Dorsal spines with very long filaments; tail trifurcate. Grey, with a purple tint, and six dusky cross-bars on the sides of body; a black spot at the posterior extremity of the spinous dorsal.

Coasts of South Carolina and Georgia.

8. Anthias macrophthalmus.

Centropristis macrophthalmus, *Müller & Troschel in Schomb. Hist. Barbad.* p. 666 (not Anthias macrophthalmus, *Bloch*).

$$D. \frac{10}{11}. \quad A. \frac{3}{8}. \quad \text{L. lat. } 58. \quad \text{L. transv. } 7/16.$$

Caudalis deeply, dorsalis not notched; the last ray of the dorsal and anal fins elongate; the diameter of the eye one-third of the length of the head; præoperculum nearly right-angular, with obtuse denticulations at the hinder and lower limbs; a large space of the angle naked.

Caribbean Sea.

a. Large specimen: stuffed. West Indies. From Dr. Janvier's Collection.
b. Fine specimen. From the Collection of the Zoological Society.

9. Anthias oculatus.

Anthias oculatus, *Cuv. & Val.* ii. p. 266. pl. 32; *Ramon de la Sagra, Hist. Cub. Poiss.* p. 10.
? Serranus oculatus, *Faun. Japon.* p. 5; *Richards. Ichth. China,* p. 235.
Hesperanthias oculatus, *Lowe.*
Centropristis oculatus, *Müll. & Trosch. in Schomb. Hist. Barbadoes,* p. 666.

D. $\frac{10}{11}$. A. $\frac{3}{8}$. L. lat. 50–51. L. transv. 6/13. Cæc. pylor. 5. Vert. 10/14.

The last ray of the dorsal and anal fins elongate; lobes of the caudal fin nearly equal in length; dorsalis deeply notched; jaws and angle of præoperculum without scales; maxillary bone with rather large scales.

Martinique; Madeira. (Japanese seas?)

a. Large specimen. South America. Presented by Sir R. Schomburgk.
b. Adult. South America. Presented by Sir R. Schomburgk.
c. Very large specimen (20″): skin. Jamaica. From Dr. Parnell's Collection.
d. Adult: skin. Jamaica. From Dr. Parnell's Collection.
e. Adult: stuffed. Madeira. Presented by the Rev. R. T. Lowe.
f. Fine specimen. Sine patria.
g. Half-grown: skin. West Indian Islands. Purchased of Mr. Scrivener.
h. Half-grown: skeleton.

Skeleton.—The upper surface of the skull is nearly flat between the eyes, exhibiting some low ridges and slight grooves; the occipital crest extends on the upper side of the skull as far only as the posterior margin of the orbit; it is rather low, and not elevated above the level of the skull. The basal part of the maxillary is somewhat flattened; it does not become very broad at its posterior extremity, where it exhibits a concave anterior margin. The intermaxillary has the posterior processes of moderate length, and a flat crescent-shaped expansion at its posterior half. The præorbital is quadrangular, oblong, twice as long as high; the posterior part of the infraorbital arch is narrow; the second and third of the bones have an excavated plate within, reaching into the inside of the orbital groove. The operculum is armed posteriorly with two points, separated from each other by a groove; the superior is short, without corresponding bony ridge; the inferior is acute and stronger, and forms the termination of a bony longitudinal ridge situated at the inner side of the operculum. The limbs of the præoperculum are directed vertically towards each other, but the angle itself is rounded; the posterior margin is exceedingly finely serrated, the inferior more coarsely; the angle is distinctly striated, the striæ terminating in small spinous teeth. There is a bony elevated ridge within the margin of the præoperculum: it shows no denticulation whatever, and is the boundary between the scaly part of the cheek and the scaleless margin of the præoperculum.

There are ten abdominal *vertebræ* and fourteen caudal; the length of the former part of the column is to that of the latter as 2 : 3. The interhæmal of the first anal spines is, like those spines themselves, feeble and short.

The *teeth* of the intermaxillary extend over all the length of the bone; the outer series is formed by larger teeth, four in front of the jaw being canine-like, but nevertheless of rather small size. The teeth of the lower jaw form a series of small cardiform teeth, behind which is another of villiform teeth; it is very narrow, and does not extend on the side of the jaw. The vomerine teeth are arranged in a rectangular narrow band; the palatine band is very narrow, and extends on the pterygoid. The inferior pharyngeal bones form an elongate sword-shaped patch of villiform teeth; the upper pharyngeal teeth are cardiform, and form three or four small groups.

10. Anthias rasor.

Serranus rasor, *Richardson, Proc. Zool. Soc.* 1839, p. 95, and *Trans. Zool. Soc.* 1849, p. 73. pl. 4. f. 1.

D. $\frac{10}{21}$. A. $\frac{3}{9}$. L. lat. 54. L. transv. 4/18. Cæc. pylor. 6.
Vert. 11/15.

Caudalis forked, but none of the fins elongate; the pectoral fin one-fourth of the total length; the lower portions of the fins densely covered with scales; the height of the body one-third of the total length; the head short, forming one-fourth of it. Shining reddish brown, with a bluish stripe from beneath the eye along the lateral line.

Australian seas.

11. Anthias schlegelii.

Caprodon, *Temm. & Schleg. Faun. Japon., Poiss.* p. 64. pl. 30; *Richards. Ichth. China*, p. 235.

D. $\frac{10}{20}$. A. $\frac{3}{9}$.

Caudal fin convex in the middle of the posterior margin, and with a slight notch above and beneath this convexity; none of the fins elongate, except the pectorals, which are ovate, longer than the head, and $3\frac{1}{2}$ in the total; head and the lower portions of the fins densely covered with scales; the height of the body one-third of the total length, the length of the head one-fourth. Rose-coloured, with two yellow stripes from the snout through the eye, and another from the eye to the angle of the præoperculum; anal fin with round yellow spots.

Japanese Sea.

This fish certainly belongs to the group of Serranina, and is closest allied to *Serranus rasor* of Richardson. One might even imagine both fishes to be identical, but for the coloration, which is said to be taken, in the figures of both the fishes, from life. Schlegel has established a separate genus, *Caprodon*, for this fish, having found five branchiostegals only, and no teeth on the palate; but as we are informed by him that these characters are taken from a mounted specimen, I have no doubt that the condition of the fish is either imperfect, or does not admit of a proper examination.

12. **Anthias longimanus.** (Plate VII. fig. B.)

B. 7. D. $\frac{10}{20}$. A. $\frac{3}{8}$. L. lat. 65.

The height of the body is $4\frac{3}{4}$ in the total length. Caudalis forked, but the pectoral only elongate, one-fourth of the total length; head entirely scaly; fins covered with scales on their greater par Vomerine teeth in a quadrangular patch.

a. Stuffed. From the Collection of the Zoological Society.

Description of the specimen.—This fish resembles *Serranus rasor* of Richardson, and the *Caprodon* of the 'Fauna Japonica,' with regard to the scaliness and the number of rays; but differs by its much more elongated body and the arrangement of the vomerine teeth. In the middle third of the fish the height of the body is nearly equal, and is contained $4\frac{3}{4}$ in the total; the length of the head is $4\frac{4}{5}$ in the total; it is covered with scales all over. The eye is placed high up, but not interfering with the upper outline of the head; it leaves a space below it deeper than its horizontal diameter, which is larger than one-fourth of the length of the head; the vertical diameter is much shorter than the horizontal. The muzzle is shorter than the eye. The nostrils of one side are close together, one before the other. The intermaxillaries are rather feeble and thin, and they have a triangular process in the middle of their posterior margin. The maxillaries widen from their origin and form a nearly regular triangle, covered with small scales; the lower jaw projects slightly beyond the upper. When the mouth is closed, the maxillary reaches to the second third of the orbit. The infraorbital arch is entirely covered with scales; no denticulations are visible on the præorbital. The interspace between the eyes is convex, and equals the diameter of the eye.

The *operculum* is armed with two flat prominent spines, the lower of which is much smaller; the sub- and inter-operculum are entire. There is no scaleless space on the præoperculum; its angle is rounded and very finely serrated, like the posterior limb and a part of the inferior. The suprascapula shows several denticulations.

The *dorsal fin* is elongate, but very low, the scales reaching over two-thirds of its height; it is more distant from the occiput than from the root of the caudal. The posterior spines and the anterior rays are nearly equal in height; the spines of moderate strength. The *caudal fin* is slightly forked, and partly covered with scales; the lobes appear to be equal in length, and about one-sixth of the total.

The origin of the *anal fin* falls below the fourth dorsal ray, its end below the thirteenth; it is as low as the dorsal fin; the second and third spines are moderate and nearly equal. The *pectoral fin* is ovate, elongate, reaching to the vertical from the soft portion of the dorsal fin; the scales between the rays cover two-thirds of the fin. The *ventral fins* are inserted immediately behind the pectoral; they are somewhat longer than one-half of the pectoral.

The intermaxillaries are furnished with a narrow band of villiform *teeth*; no canine tooth in front is visible, but there are several, card-like, inside the mouth in a cluster, occupying the space near the symphysis of the intermaxillaries. The band in the lower jaw is much broader, and there are canines in front of the jaw as well as in the middle of the side. The vomerine teeth form a broad and long quadrangular patch, with the anterior sides shorter and the posterior ones longer (◊); there is a cuneiform band of palatine teeth, and a shorter one, ovate, and separated from the former, on the pterygoid bones.

The scales are of moderate size, with smooth surface and fine posterior serrature. The specimen is now discoloured, but appears to have had a red ground-colour. To judge from the species allied to it, its native sea may be some part of the Indian or Australian seas.

	inches.	lines.
Total length	12	0
Height of the body	2	7
Length of the head	2	5
Diameter of eye	0	8
Length of tenth dorsal spine	0	9½
——— of the caudal fin	1	11
——— of second anal spine	0	10
——— of pectoral fin	3	0
——— of ventral fin	1	8

13. Anthias cichlops.

Serranus cichlops, *Bleeker, Sumatra,* i. p. 3.

D. $\frac{5}{15-16}$. A. $\frac{3}{6-7}$. L. lat. 45.

Second ray of the ventral fins and lobes of the caudalis elongate; angle of præoperculum with four spinous teeth, much stronger than the others. Red (in life); tail and caudalis yellow.

Priaman (Sumatra)

24. ANYPERODON.

Serranus, sp., *Cuv. & Val.* ii. p. 347.

Seven branchiostegals. Teeth in villiform bands, with canines in both jaws; no teeth on the palatine bones, nor on the tongue.

One dorsal with eleven spines, the anal fin with three. Operculum with two or three points; præoperculum serrated. Scales small, ctenoid.

From the Seychelles to the Molucca Sea.

1. Anyperodon leucogrammicus.

Renard, Poiss. t. 1. f. 6; *Valent.* iii. p. 476. f. 409.

Serranus leucogrammicus, (*Reinw.*) *Cuv. & Val.* ii. p. 347; *Bleeker Perc.* p. 33.

D. $\frac{11}{15}$. A. $\frac{3}{9}$. L. lat. 80.

The height of the body is one-fourth of the total length, the length of the head one-third; the diameter of the eye is one-seventh of the latter. Operculum with three spines, præoperculum finely and equally serrated; sub- and inter-operculum with denticulations. Caudalis rounded. Brownish, with three whitish longitudinal bands, and with brown spots above.

Seychelles; Molucca Sea.

a. Adult. Amboyna. From Mr. Frank's Collection.

25. PRIONODES.

Prionodes, *Jenyns, Zool. Beagle, Fishes,* p. 46.

Body oblong; muzzle with the lower jaw prominent. Canine teeth; no teeth on the vomer or the palatine bones. Seven branchiostegals. One dorsal with ten, the anal fin with three spines. Præoperculum serrated; operculum with two or three spines. Scales moderate, ctenoid.

The form of this fish, as the Rev. L. Jenyns has pointed out, is so completely that of a *Serranus*, that we may well hesitate to refer it to another family (*Sciænidæ*). One specimen only being known, it is possible either that the absence of vomerine teeth is accidental in that specimen, or dependent on the age of the fish. But if this be not the case, the structure of the fins and of the opercles is as important a character as the absence or presence of a patch of minute teeth, and therefore I think it better to place this fish in the group of Serranina.

1. Prionodes fasciatus.

Jenyns, l. c. p. 47. pl. 9. f. 1.

D. $\frac{10}{12}$. A. $\frac{3}{7}$.

Brownish, with numerous dusky cross-bars; the vertical fins with black ocellated spots. The posterior limb of the præoperculum serrated.

Chatham Island (Galapagos Archipelago).

26. SERRANUS*.

Serranus, sp., *Cuv. Règne Anim.*: *Cuv. & Val.* ii. p. 210.

Seven branchiostegals. Teeth villiform, with very distinct canines in both jaws; teeth on the palatine bones; tongue smooth. One dorsal fin, mostly with nine or eleven, rarely with eight, ten, or twelve spines; anal fin with three. Operculum with two or three acute points; præoperculum more or less serrated, without spinous teeth on the lower limb. Scales small.

All the seas of the temperate and tropical regions.

Synopsis of the Species.

I. SERRANI with deeply forked caudal fin,

A. And with the two middle rays of caudal fin much elongate:

1. S. phaëton.

B. With the two middle rays of caudal fin shortest†:

2. S. creolus,
3. S. colonus.
4. S. louti,
5. S. flavimarginatus,
6. S. filamentosus,
7. S. zonatus.

II. SERRANI with slightly convex or concave, or with truncated caudal fin.

A. With less than eight soft rays in the anal fin, and with more than twelve in the dorsalis:

8. S. scriba,
9. S. humeralis,
10. S. albomaculatus,
11. S. rhyncholepis,
12. S. gymnopareius.

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* 1. Holocentrus auratus, *Bl.* pl. 236; *Bl. Schn.* p. 314.—Serranus auratus, *Cuv. & Val.* ii. p. 364.—East Indies?

2. Holocentrus cærulcopunctatus, *Bl.* t. 242. f. 4; *Bl. Schn.* p. 315.—Serranus cæruleopunctatus, *Cuv. & Val.* ii. p. 366.—Habitat —— ?

3. Serranus corallicola, (*K. & v. H.*) *Cuv. & Val.* ii. p. 366.—Java.

4. Holocentrus argentinus, *Bl.* t. 235. f. 2.—*Bl. Schn.* p. 314.—Serranus argentinus, *Cuv. & Val.* ii. p. 241.—Habitat —— ?

5. Serranus variegatus, *Richards. Ichth. China*, p. 231.—Canton.

6. Serranus reevesii, *Richards. l. c.* p. 232.—Canton.

7. Perca lunaria, *Forsk.* p. 39.—Percæ rogaæ var. lunaria, *Bl. Schn.* p. 335—Red Sea.

8. Serranus tæniocheirus, *Cuv. & Val.* vi. p. 518.—East Indies?

9. Serranus roseus, *Cuv. & Val.* ii. p. 306.—Otaheiti.

10. Serranus peruanus, *Less. Voy. Coq. Zool.* ii. p. 234.—Peru.

11. Serranus abdominalis, *Peters, in Wiegm. Archiv*, 1855, p. 237.—Mozambique.

12. Serranus goliath, *Peters, l. c.*—Mozambique.

13. Serranus parkinsonii, *Cuv. & Val.* ii. p. 329.—Habitat —— ?

14. Bonaci arara, *Parra*, pl. 16. f. 2.—Johnius guttatus, var., *Bl. Schn.* p. 77.—Serranus arara, *Cuv. & Val.* ii. p. 377.

15. Bonaci cardinal, *Parra*, pl. 16. f. 1.—Johnius guttatus, *Bl. Schn.* p. 77.—Serranus cardinalis, *Cuv. & Val.* ii. p. 378.

16. *Parra*, pl. 36. f. 1.—Lutjanus lunulatus, *Bl. Schn.* p. 329.—Serranus lunulatus, *Cuv. & Val.* ii. p. 379.—West Indies.

† 1. Perca lepidoptera, *Forst.*—Epinephelus lepidopterus, *Bl. Schn.* p. 302.—Serranus lepidopterus, *Richards. Ann. & Mag. Nat. Hist.* 1842. ix. p. 18.—Australia.

B. With eight or more soft rays in the anal fin.

1. Body with cross-bands or large oblong transverse spots[*].

a. Denticulations of præoperculum stronger on the angle:

13. S. cabrilla,
14. S. brunneus,
15. S. kawamebari,
16. S. lanceolatus,
17. S. albofuscus,
18. S. sexfasciatus,
19. S. mystacinus,
20. S. oceanicus,
21. S. trimaculatus,
22. S. diacanthus,
23. S. striatus,
24. S. stigmapomus.

b. Denticulations of præoperculum conspicuous and equal:

25. S. tigris,
26. S. boenack,
27. S. nigri,
28. S. semipunctatus,
29. S. tigrinus,
30. S. papilionaceus.

c. Denticulations of præoperculum exceedingly fine or obsolete:

31. S. oxyrhynchus, 32. S. argus.

2. Body of uniform coloration or spotted; with neither transverse nor longitudinal bands[†].

a. Dorsalis with nine, rarely with eight spines; and

α. With seventeen or eighteen soft rays[‡]:

33. S. rogaa, 34. S. zananella.

β. With sixteen soft rays (rarely with fifteen to seventeen)[§]:

35. S. pachycentrum,
36. S. erythræus,
37. S. microprion,
38. S. cyanostigmatoides,
39. S. cyanostigma,
40. S. miniatus.

γ. With fifteen (rarely with fourteen) soft rays[‖]:

41. S. aurantius,
42. S. sexmaculatus,
43. S. nigripinnis,
44. S. hemistictus,
45. S. guttatus,
46. S. ouatalibi,
47. S. tæniops,
48. S. sonnerati,
49. S. urodelus,
50. S. analis,
51. S. zanana.

δ. With fourteen (rarely with fifteen) rays:

52. S. leopardus, 53. S. coronatus.

ε. With twelve rays:

54. S. spiloparœus.

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[*] 1. Serranus semifasciatus, *Gay, Chile, Zool.* ii. p. 151, *Ictiol.* pl. 1 *b.* f. 2.—Chile.

[†] 1. Holocentrus pantherinus, *Lacép.* iii. pl. 27. f. 3.—Serranus pantherinus, *Cuv. & Val.* ii. p. 333.—Madagascar.
2. Serranus cyanopodus, *Richards. Ichth. China*, p. 233.

[‡] 1. Epinephelus ruber, *Bloch*, t. 331.—Serranus aurantius, *Cuv. & Val.* ii. p. 305.

[§] 1. Serranus rufus, *Hombr. & Jacq. Voy. au Pôle Sud, Poiss.* p. 35. pl. 1. f. 4.—Habitat —— ?

[‖] 1. Serranus pixanga, *Cuv. & Val.* ii. p. 383; *Margr.* p. 152.—Holocentrus punctatus, *Bloch*, t. 241; *Bl. Schn.* p. 315.
2. Serranus guativere, *Cuv. & Val. l. c. Parra*, pl. 5. f. 1.—*Schomburgk, Hist. Barbad.* p. 665.

b. Dorsalis with ten or eleven (rarely with twelve) spines, and

a. With eleven or twelve rays:

55. S. limbatus,
56. S. nouleny.

β. With thirteen or fourteen rays*:

57. S. lutra,
58. S. goldmanni,
59. S. pavoninus.

γ. With fourteen or fifteen rays†:

60. S. angularis,
61. S. suillus,
62. S. fuscoguttatus,
63. S. altivelioides,
64. S. polyphekadion,
65. S. salmonoides,
66. S. epistictus,
67. S. bataviensis,
68. S. alboguttatus,
69. S. polystigma,
70. S. maculatus,
71. S. galeus,
72. S. niveatus,
73. S. margaritifer.

δ. With fifteen or sixteen rays‡:

74. S. gigas,
75. S. moara,
76. S. goreensis,
77. S. erythrogaster,
78. S. fuscus,
79. S. æneus,
80. S. emarginatus,
81. S. nigritus,
82. S. acutirostris,
83. S. marginalis,
84. S. horridus,
85. S. crapao,
86. S. sebæ,
87. S. summana,
88. S. micronotatus,
89. S. tumilabris,
90. S. hoevenii,
91. S. bontoo,
92. S. celebicus,
93. S. variolosus.
94. S. hoedtii,
95. S. akaara,
96. S. apua,
97. S. mentzelii.

ε. With fifteen to seventeen rays:

98. S. hexagonatus.

ζ. With sixteen or seventeen rays §:

99. S. morio,
100. S. impetiginosus,
101. S. ongus,
102. S. undulosus,
103. S. tsirimenara,
104. S. punctatissimus,
105. S. rupestris,
106. S. flavo-cæruleus,
107. S. spiniger,
108. S. ura,
109. S. melanurus,
110. S. gilberti,
111. S. nebulosus,
112. S. bontoides,
113. S. macrospilos,
114. S. areolatus,
115. S. awoara,
116. S. geographicus,
117. S. reticularis,
118. S. gaimardi,
119. S. chlorostigma,
120. S. cylindricus,
121. S. labriformis.

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* 1. Serranus jansenii, *Bleek. Sangi*, p. 376.—Sangi Sea.

† 1. Serranus aspersus, *Jenyns, Zool. Beag. Fishes*, p. 6.—Cape Verde Islands.
2. Itaiara, *Margr.* cap. iii. p. 145.—Serranus itaiara, *Lichtenst. Berl. Abhandl.* 1821, p. 278; *Cuv. & Val.* ii. p. 376; *Schomb. Reis. Brit. Guian.* p. 621.

‡ 1. Serranus erythrurus, *Cuv. & Val.* ii. p. 320.—Malabar.
2. —— maculosus, *Cuv. & Val.* ii. p. 332.—Habitat ——? If this species should hereafter be recognized, the denomination of *maculosus* must be changed, Bloch having given to another Serranus the name of *maculatus*, which was afterwards altered by Cuvier into *catus*.
3. —— alexandrinus, *Cuv. & Val.* ii. p. 281.—Mediterranean.
4. —— dermochirus, *Cuv. & Val.* vi. p. 513.—Coromandel.
5. —— kunhardtii, *Bleek. Natuurk. Tydschr. Nederl. Ind.* 1851, p. 169.—Sumatra.
6. —— lebretonianus, *Hombr. & Jacq. Voy. au Pôle Sud, Poiss.* p. 33. pl. 1. f. 3.—Habitat —— ?

§ 1. Serranus rivulatus, *Cuv. & Val.* vi. p. 515.—Isle de France.
2. —— nigriceps, *Cuv. & Val.* vi. p. 517.—Polynesia.
3. —— miliaris, *Cuv. & Val.* vi. p. 520.—New Guinea.
4. —— flavoguttatus, *Peters, Wiegm. Arch.* 1855, p. 235.—Mozambique.

η. With eighteen or nineteen rays:

122. S. altivelis,
123. S. inermis,
124. S. quoyanus,
125. S. olfax.

θ. With nineteen or twenty rays:

126. S. dermopterus.

3. Body with longitudinal bands*:

127. S. formosus,
128. S. latifasciatus,
129. S. morrhua,
130. S. biguttatus,
131. S. pœcilonotus,
132. S. lemniscatus,
133. S. urophthalmus,
134. S. lineatus,
135. S. amboinensis.

I. Serrani with deeply forked caudal fin,

A. and with the two middle rays of caudal fin much elongate.

1. Serranus phaëton.

Cuv. & Val. ii. p. 310. pl. 34.

D. $\frac{9}{11?}$. A. $\frac{3}{9}$.

Caudalis forked, with the two middle rays as long as the body, both sheathed together in a membrane, the other rays strong and compressed; præoperculum with exceedingly fine denticulations. Palatine and vomerine teeth very fine.

Hab. ——?

B. With the two middle rays of caudal fin shortest.

2. Serranus creolus.

? *Parra*, pl. 20. f. 2.
Serranus creolus, *Cuv. & Val.* ii. p. 265; *Cuv. Règne Anim. Ill. Ichthyol.* pl. 8. f. 1 (coloration?).

D. $\frac{9}{19}$. A. $\frac{3}{9}$. L. lat. 90. Vert. 10/14.

Snout short. The upper maxillary bone reaching to below the middle of the eye; præoperculum with very fine and equal serrature; interoperculum minutely serrated, or without any serrature. Caudal fin deeply forked, with elongate lobes. Reddish, with four small round violet spots on each side; dorsal fin with a blackish longitudinal streak.

Caribbean Sea.

a. Fine specimen. Cuba. From the Collection of the Zoological Society.
b. Adult stuffed. West Indies. Purchased of Mr. Scrivener.
c, d. Fine specimens. America. From the Haslar Collection.
e. Adult. America.
f. Adult. America. From the Haslar Collection.
g. Adult: skeleton. America.

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* 1. **Serranus** chlorocephalus, *Cuv. & Val.* vi. p. 522.—Polynesia. Identical with *S. lineatus*?

Skeleton.—The upper surface of the skull is rather broad, and divided into two lateral halves by the high supraoccipital crest, which extends to the level of the anterior third of the eye. The crest is thin, transparent, and rounded behind; the two lateral crests between the orbit and the suprascapula are also well developed. Just beneath the anterior end of the supraoccipital crest is a broad and open cavity for receiving the posterior processes of the intermaxillaries. The intermaxillary is about two-thirds of the length of the maxillary, and has a very prominent flat process behind. The maxillary gradually widens, and has a rather convex superior margin and a rather concave inferior one; the supplementary bone is narrow. The greater part of the præorbital is as broad as the posterior infraorbital arch; the latter with a very broad and excavated inner plate for supporting the eyeball from beneath.

Operculum with three spines, the two lower of which are close together; the sub- and interoperculum are without any serrature in this specimen. The angle of the præoperculum is rounded, and furnished with several obsolete and obtuse denticulations; the posterior serrature of the bone is minute.

The *dentition* is feeble: there is in the upper and lower jaws a pair of small canines; there are no lateral canines; the other teeth are in villiform bands, that of the intermaxillary reaching nearly to the extremity of the bone, and with an outer series of scarcely larger teeth. The vomerine teeth form a triangular patch with a rather concave posterior side. The palatine teeth form a cuneiform band, broader in front, and not extending beyond that bone.

Ten abdominal and fourteen caudal *vertebræ*. The interhæmal is attached to the hæmal spine of the eleventh vertebra, of moderate strength, and equal to the length of the first to the seventh vertebra.

3. Serranus colonus.

Valenc. Voy. Vénus, Zool. p. 300. pl. 2. f. 1 (not good).

D. $\frac{9}{18}$. A. $\frac{3}{10}$. L. lat. 120.

Snout short; præoperculum finely serrated; caudal fin deeply forked, with elongate lobes. Uniform yellow. (*Val.*)

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4. Serranus louti.

Seba, iii. 27. 7; *Renard*, t. 41. f. 207, t. 21. f. 100; *Valentyn*, p. 412. f. 205.
Perca louti, *Forskal*, p. 40.
Labrus punctatus, *Lacép.* iii. p. 377. pl. 17. f. 2.
Bodianus louti, *Bl. Schn.* p. 332; *Lacép.* iv. p. 286.
Serranus punctulatus, *Cuv. & Val.* ii. p. 367, ix. p. 435; *Bleek. Sum.* i. p. 570; *Quoy & Gaim. Voy. Astrol. Poiss.* p. 654. pl. 3. f. 2.
—— louti, *Rüpp. Atl.* p. 106. pl. 26. f. 2 (not *Val.*).

D. $\frac{9}{13-14}$. A. $\frac{3}{8}$. L. lat. 100. Vert. 10/14.

Caudalis deeply forked, with elongate lobes; dorsal, anal and ventral fins pointed; denticulations of præoperculum obsolete. Brownish, with small whitish spots.

Red Sea; Isle de France; Ceylon; Molucca Sea; Sumatra; Timor; Waigiou.

a. Adult: skin. Copang (Timor). D. $\frac{9}{13}$.
b. Adult: stuffed. Isle de France. D. $\frac{9}{14}$.
c. Adult. Isle de France. From the Collection of the Zoological Society. D. $\frac{9}{14}$.
d. Adult: skeleton. Isle de France. From the Collection of the Zoological Society. D. $\frac{9}{14}$.
e. Adult: stuffed. Red Sea. D. $\frac{9}{14}$.
f. Adult. Sine patria. From the Haslar Collection.
g. Adult: bad state. Sine patria. From the Haslar Collection.
h. Half-grown. Amboyna. Purchased of Mr. Frank.

Skeleton.—The crown of the head and the interspace between the eyes are without prominent ridges or deep grooves; they are narrow and rather flat. The supraoccipital and the lateral crests are rather low, the former not extending beyond the supraoccipital bone. The two posterior processes of the intermaxillaries are not received into a common groove, but run on the sides of a narrow longitudinal ridge. The posterior part of the infraorbital arch is narrow, and has inside a broad excavated plate for supporting the eyeball from beneath. The length of the intermaxillary is about two-thirds of that of the maxillary; it has a flat prominence behind, above which is a deep notch. The maxillary widens from its second third; the superior margin is nearly straight, the inferior concave; the supplementary bone is exceedingly narrow. The operculum has three distinct flat spines, the middle of which is longest and nearer the lower than the superior; the sub- and interoperculum are without any serrature; the præoperculum is rounded throughout, and has some very indistinct serrature at the rounded angle.

The *dentition* is rather powerful. There are in the upper jaw two very strong canines; the outer series is formed by shorter, but thicker teeth than the others, and does not extend to the extremity of the bone. Inside of the canines and the series mentioned is a band of villiform teeth, broadest behind the canines; and here also are placed several long and slender teeth of more cardiform appearance. The lower jaw is armed in front with a pair of canines, and with another in the middle of its lateral band, but they are rather smaller than those of the upper jaw. In the villiform band several cardiform teeth are visible. The vomerine teeth are arranged in two series, meeting anteriorly at a rather obtuse angle. The band of palatine teeth is narrow, and does not extend on the pterygoid bone.

There are ten abdominal and fourteen caudal *vertebræ*. The interhæmal is attached to the hæmal spines of the tenth and eleventh vertebræ; it is slender, and equals the length of the second to the seventh vertebra.

5. Serranus flavimarginatus.

Rüppell, Atlas, Fische, p. 109.

D. $\frac{9}{14}$. A. $\frac{3}{8}$.

Caudalis deeply forked, analis and dorsalis pointed behind. Reddish brown, covered with small blue spots; a black band from the eye to the base of caudalis; the vertical fins with a yellow edge; on each side of the tail a black spot. Allied to *S. punctulatus.*

Red Sea.

6. Serranus filamentosus.

Serranus filamentosus, *Cuv. & Val.* vi. p. 508.
Centropristes filamentosus, *Müll. & Trosch. in Schomb. Hist. Barbad.* p. 666.

D. $\frac{10}{11}$. A. $\frac{3}{8}$.

External appearance sparoid. Caudalis deeply forked; the last ray of the dorsal and anal fins elongate, twice as long as the preceding. Denticulations of the præoperculum coarser at the angle; operculum with two flat spines. Brownish, with small specks in the angle of each scale; sides lighter; dorsal fin with yellow spots along the base. (*Val.*)

Isle de France.

7. Serranus zonatus.

Serranus zonatus, *Cuv. & Val.* vi. p. 509.
? Serranus argyrogrammicus, *Cuv. & Val.* viii. p. 472.

D. $\frac{10}{11}$. A. $\frac{3}{8}$.

Caudalis deeply forked; pectoral fins long, pointed; the last ray of the dorsal and anal fins elongate, twice as long as the preceding. The diameter of the eye one-third of the length of the head; præoperculum very finely serrated, with coarser denticulations at the angle; suprascapula denticulated. Rose-coloured in life, with four orange cross-bands, lost on the sides; caudal fin with a bright yellow edge. (*Val.*)

Isle de France.

II. Serrani with the caudal fin slightly convex or slightly concave, or truncated.

A. With less than eight rays in the anal fin, and with more than twelve rays in the dorsal.

8. Serranus scriba.

? Πέρκη, *Aristot.* ii. c. 13, 17, viii. c. 15; *Athen.* vii. fol. 159; *Oppian,* i. v. 124.
? Perca, *Plin.* ix. c. 16.
Phycis, *Salviani*, p. 227. f. 92.
Perca marina, *Gesner*, pp. 696, 819; *Jonston*, i. c. 1. t. 14. f. 8; *Willughby*, p. 327; *Ray*, p. 140; *L. Gm.* p. 1313; *Brünnich, Ichthyol. Massil.* p. 63; *De la Roche, Ann. Mus.* xiii. p. 350.
Perca no. 6, *Artedi, Genera*, p. 40.
Perca scriba, *L. Mus. Ad. Fried.* p. 56; *Gm. L.* p. 1315.

Holocentrus marinus, *Lacép.* iv. p. 376: *Risso, Ichth. Nice*, p. 291.
—— argus, *Spinola, Ann. du Mus.* x. p. 372.
? —— fasciatus, *Bloch*, pl. 240: *Bl. Schn.* p. 314: *Lacép.* iv. p. 380: *Risso, Ichth. Nice*, p. 290.
—— maroccanus, *Bl. Schn.* p. 320.
Lutjanus scriptura, *Lacép.* iv. p. 229.
Cavolini, Ueber die Erzeugung der Fische, übers. von Zimmermann, p. 84. t. 1. f. 16–18.
Serranus scriba, *Cuv. & Val.* ii. p. 214. pl. 28; *Martens. Reise nach Venedig*, ii. p. 425; *Nordmann in Demidoff, Voy. Russ. Mérid.* iii. p. 366. pl. 2. f. 1; *Guichen. Explor. Sc. Algér. Poiss.* p. 33.

D. $\frac{10}{14}$. A. $\frac{3}{7}$. L. lat. 70. Vert. 10/14.

Præoperculum equally and finely denticulated. Body with five to seven blackish transverse bands; head with irregularly reticulated blue lines; vertical and ventral fins with small round reddish spots.

Mediterranean; Black Sea.

a. Adult. Dalmatia.
b. Adult: skeleton. Bay of Naples. Presented by S. P. Pratt, Esq.
c. Adult: bad state. Sicily. Presented by W. Swainson, Esq.
d. Adult. Presented by W. Swainson, Esq.
e. Adult: skin. Mediterranean. Presented by Richard Santhill, Esq.
f. Adult. Mediterranean. From the Haslar Collection.
g. Half-grown. Mediterranean.
h. Half-grown. Mediterranean. From the Haslar Collection.
i. Half-grown: bad state. Malta. From the Haslar Collection.
k. Adult: stuffed. Malta. From Mr. Yarrell's Collection.
l. Adult: not good state. Europe. From Mr. Frank's Collection.
m, *n*. Adult: very bad state. Europe.
o. Adult. Europe.
p–*r*. Adult: stuffed. Europe. From Mr. Yarrell's Collection.
s, *t*. Adult: skin. Europe. From Mr. Yarrell's Collection.
u. Young: not good state. Europe. From the Haslar Collection.

Skeleton.—The upper part of the skull is nearly smooth, without prominent ridges; even the occipital crest is not very much developed. The bones of the suborbital arch are not distinctly separated from one another, and there is, as in all the *Serrani*, a broad interior process for supporting the eyeball from beneath. The two upper spines of the operculum are the hinder ends of two strong bony ridges; the third spine is feeble, as is also the ridge belonging to it; the sub- and interoperculum are entire; the edge of the præoperculum is rounded, with minute denticulations behind, gradually becoming larger at the angle, and disappearing in the middle of the lower limb; the suprascapula is minutely serrated. The number of vertebræ as above stated.

9. Serranus humeralis.

Cuv. & Val. ii. p. 246: *Less. Voy. Coq. Zool.* ii. p. 236; *Gay, Chile, Zool.* ii. p. 149.

D. $\frac{10}{14}$. A. $\frac{3}{7}$.

Præoperculum equally and finely denticulated. The brown coloration of the back emitting six transverse bands towards the belly; operculum brown; cheeks brown-spotted; a large brown blotch in front of the root of the pectoral fin; fins not spotted.

Coast of Chili.

10. Serranus albomaculatus.

Jenyns, Zool. of the Beagle, Fishes, p. 3. pl. 2.

D. $\frac{10}{13}$. A. $\frac{3}{7}$.

Caudalis truncated. The length of the head one-third of the total; the diameter of the eyes about one-sixth of the length of the head, larger than the distance between them. Præoperculum finely serrated, with coarser denticulations at the angle and along the posterior half of the basal margin; suprascapula denticulated. The third dorsal spine very long, more than twice as long as the second, equalling more than half the height of the body. On the sides a series of five or six good-sized snow-white spots, and one placed above. (*Jen.*)

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11. Serranus rhyncholepis.

Bleeker, Celebes, iii. p. 749.

D. $\frac{11}{16-17}$. A. $\frac{3}{7}$. L. lat. 80.

Caudalis rounded; the diameter of the eye is $4\frac{1}{2}$ in the length of the head; upper maxillary bone reaching behind the eye. Præoperculum serrated, with stronger denticulations at the angle; sub- and interoperculum entire; the spinous and soft parts of dorsal fin of equal height. Brown, each scale on the sides with a lighter speck; fins immaculate. (*Bl.*)

Sea of Bulucomba (Celebes).

Bleeker compares this species with *S. labriformis*, Jenyns; he states the number of the rays of the anal fin to be $\frac{3}{7-8}$; but as he always reckons the last as two, I am obliged to remove this species from *S. labriformis* into another group with seven soft rays in the anal fin. Further examination of other specimens will show whether I am right in so doing.

12. Serranus gymnopareius.

? Epinephelus striatus, *Bloch*, t. 330.
Serranus gymnopareius, *Cuv. & Val.* ii. p. 248.

D. $\frac{9}{17}$. A. $\frac{3}{7}$.

Præoperculum without scales, only its posterior limb denticulated; caudalis truncated. Body with seven or eight dark-brown cross-bands.

Jamaica (?)

B. With eight or more soft rays in the anal fin.

1. Body with cross-bands or large oblong transverse spots.

a. Denticulations of præoperculum stronger at the angle.

13. **Serranus cabrilla.**

Χαννή, *Salviani.*
? Perca, *Rondel.* vi. cap. 8.
Perca cabrilla, *Linn. Syst.* i. p. 488.
? —— mormyrus, *Gronov. Syst. ed. Gray*, p. 109.
—— marina, var. β, *Brünnich.*
Holocentrus virescens, *Bl.* t. 233; *Lacép.* iv. p. 357.
—— marinus, *Lacép.* iv. p. 376.
Lutjanus serranus, *Lacép.* iv. p. 205.
Serranus cabrilla, flavus, *Risso, Ichth. Nice*, pp. 375, 376.
—— cabrilla, *Cuv. & Val.* ii. p. 223. pl. 29; *White, Catal. of Brit. Fishes*, p. 11; *Yarrell, Brit. Fishes*, i. p. 11; *Nordmann in Demidoff's Voy. Russ. Mérid.* iii. p. 367; *Guichen. Explor. Sc. Algér. Poiss.* p. 33. pl. 1.
Perca channus, *Couch in Loud. Mag. Nat. Hist.* v. p. 19. f. 6.

D. $\frac{10}{14}$. A. $\frac{3}{8}$. L. lat. 80–90. L. transv. 9/25.

Caudalis truncated; denticulations of the angle of the præoperculum not much stronger. Sides of the head with three oblique red bands; body with seven or more dark-brown cross-bands; sometimes a reddish lateral band.

Mediterranean; Black Sea; coasts of Portugal and France; southern coast of England; St. Paul's (West Indies).

a. Adult. Dalmatia.
b. Adult. Lisbon.
c. Adult: not good state. Lisbon. Presented by G. Hough, Esq.
d. Adult. London market. Presented by Messrs. J. and C. Grove.
e–g. Adult and half-grown: skins. Plymouth. From Mr. Yarrell's Collection.
h. Adult: stuffed. Plymouth. Presented by Lieut. H. F. Spencer, R.N.
i. Adult: not good state. Madeira. Old Collection as *Perca decorata.*
k–m. Adult and half-grown: skins. Santa Cruz (Teneriffe).
n. Adult: not good state. Europe.
o. Adult: bad state. Europe. Old Collection.
p, q. Adult: very bad state. Europe.
r, s. Adult: stuffed. England.
t. Adult: stuffed. Europe. Old Collection.
u, v. Half-grown: skins. Europe. From Mr. Yarrell's Collection.
w. Young: skin. Europe. From Mr. Yarrell's Collection.
x. Adult: skeleton. England.
y–α. Half-grown. St. Paul's. Presented by the Lords of the Admiralty.
β. Adult: stuffed. Europe.
γ. Adult: stuffed. Lisbon.

14. Serranus brunneus.

Epinephelus brunneus, *Bloch*, t. 328. f. 2; *Bl. Schn.* p. 300.
Serranus kawamebari, *Richardson, Ichth. China*, p. 234 (not *Faun. Japon.*).

D. $\frac{11}{13}$. A. $\frac{3}{8}$. L. lat. 95.

Caudalis rounded. The height of the body is one-fourth, and the length of the head one-third of the total length; the diameter of the eye is one-sixth of the length of the head. The upper maxillary bone reaches beyond the level of the posterior margin of the eye. Pectorals rather longer than ventrals, not extending to the vent. The dorsal spines nearly equal in length, except the first two and the last; the second anal spine not much stronger and not longer than the third. Brownish, with six darker cross-bands, inclining forwards as they descend; the first narrowest from the first dorsal spines to the eye; cheeks with oblique darker bands. Fins immaculate.

Chinese Sea.

a, *b*. Adult. China. Presented by J. R. Reeves, Esq.
c. Half-grown. China. Presented by J. R. Reeves, Esq.

Bloch says, in his great work on Fishes, that this species is found in Norway—probably because he received the fish from a friend in Norway; but Schneider gives Japan as its native country. The figure may be easily recognized; but the first curved band from the eye to the dorsal fin (very characteristic of the species) is omitted.

15. Serranus kawamebari.

Temm. & Schleg. Faun. Japon. p. 5.

D. $\frac{12}{12}$. A. $\frac{2}{10}$.

Caudalis with a rather convex posterior margin; præoperculum rather deeply serrated, with stronger denticulations at the angle; interoperculum and suprascapula denticulated; the spinous part of the dorsal fin not much elevated. Brownish, with five darker cross-bands; the soft part of dorsalis, the caudal and anal fins with small round spots; operculum with a deep black spot between the spines; præoperculum with two brown streaks from the eye.

Japanese Seas.

16. Serranus lanceolatus.

Holocentrus lanceolatus, *Bloch*, t. 242. f. 1; *Shaw, Zool.* iv. p. 567; *Russell*, t. 130.
Serranus lanceolatus, *Cuv. & Val.* ii. p. 316; *Bleeker, Perc.* p. 35; *Cantor, Catal.* p. 8.

D. $\frac{11}{15-16}$. A. $\frac{3}{8}$.

Caudalis rounded. Length of the head about one-third of the total; the diameter of the eye one-sixth or one-seventh of the length of head. Sub- and interoperculum entire. Yellowish, with five brown cross-bands: first from the orbit over the præoperculum; second from the crown of the head obliquely over the operculum to behind the pectoral fins; third very broad, occupying the space between the second and tenth spine, confluent below with the second band; fourth broad, spanning nearly the eight posterior dorsal rays; fifth in front of the caudal: all the fins with round brown spots.

Bay of Bengal; Batavia; Samarang.

This species is well distinguished by its coloration. Bleeker states that in adult specimens the bands become obsolete, and that the coloration changes to yellowish marbled with brownish. A single specimen, of about four inches in length, exists in the Collection of the East India Museum.

17. Serranus albofuscus.

Holocentrus maculatus, *Bl.* iv. p. 96. t. 242. f. 3; *Bl. Schn.* p. 315.
—— albofuscus, *Lacép.* iv. pp. 341, 384, 385.
Serranus maculatus, *Bleeker, Boeroe*, p. 398.

$D. \frac{11}{16-17}$. $A. \frac{3}{8}$. L. lat. 100.

Caudalis rounded; the diameter of the eye one-third (?) of the length of the head; the upper maxillary bone reaching to the level of the posterior margin of the eye; præoperculum serrated, with a much longer spinous tooth at the angle; sub- and interoperculum entire; the second, third and fourth dorsal spines longest; the third anal spine stronger and rather longer than the second. Brown, with large pearl-coloured spots; on the head four or five, on the back three transverse blotches, more or less extending on the dorsal fin: one between scapula and anterior dorsal spines, the second between the lateral line and the upper edge of the hinder part of the spinous dorsal, the third across the back of the tail behind the dorsal. Dorsal fin brown, with three round black spots on the soft part; pectorals blackish, with pearl-coloured spots and a band of the same colour across the middle; anal and ventral fins brown, the former with a pearl-coloured spot; caudalis yellow, with large brown spots. (*Bl.*)

Sea of Boeroe.

18. Serranus sexfasciatus.

Serranus sexfasciatus, (*Kuhl & v. Hass.*) *Cuv. & Val.* ii. p. 360; *Bleeker, Perc.* p. 38.

$D. \frac{11}{15}$. $A. \frac{3}{8}$.

Caudalis rounded; sub- and interoperculum entire; angle of the præoperculum with very strong teeth. Body with six dark brown cross-bands; head uniform; dorsal and caudal fins with roundish brown spots.

Javanese Sea.

a. Half-grown: skin: bad state. East Indies. Presented by B. H. Hodgson, Esq.

19. Serranus mystacinus.

Serranus mystacinus, *Poey, Memorias de Cuba*, 1851, p. 52. lam. 10. f. 1.
? Serranus octocinctus, *Temm. & Schleg. Faun. Japon. Poiss.* p. 7. pl. 4 *a*.

D. $\frac{11}{14-15}$. A. $\frac{3}{9}$. L. lat. 100.

The height of the body is $3\frac{1}{4}$ in the total length, the length of the head three times. Præoperculum with some very strong spinous teeth at the angle, partly extending on the horizontal limb. Caudalis rounded; pectorals reaching a little beyond the vent. Reddish, with ten dark cross-bands; fins immaculate.

Caribbean Sea.

a. Adult. South America. Presented by Sir R. Schomburgk.

According to Poey's statement, this species makes a remarkable exception to most of the *Serrani* in having at least twelve stems of the pyloric appendages, each divided again into several branches; an increased number is also to be observed in *S. inermis*, from the same locality. The description of *S. octocinctus*, given in the Faun. Japon. p. 7, pl. 4*a*, agrees exactly with the specimen mentioned above. There is another specimen in the Collection of the British Museum, said to be from the Isle de France, which cannot be separated from the former.

b. Adult: stuffed. Isle de France. Presented by Dr. Janvier.

20. Serranus oceanicus.

? Perca fasciata, *Forskal*, p. 40.
Holocentrus oceanicus, *Lacép.* iv. p. 377. t. 7. f. 3.
—— forskalii, *Lacép.* iv. p. 377.
Serranus oceanicus, *Cuv. & Val.* ii. p. 302.
Serrani marginalis var., *Bleeker, Perc.* p. 34.

D. $\frac{11}{16}$. A. $\frac{3}{8}$.

Caudalis truncated; sub- and interoperculum entire; denticulations of the angle of the præoperculum not much stronger. Reddish, with five darker cross-bands; head uniform; the anterior half of the dorsalis with a blackish edge; caudalis not black-edged.

Red Sea; Isle de France.

21. Serranus trimaculatus.

Epinephelus japonicus, *Krusenst. Reise*, pl. 64. f. 2.
Serranus trimaculatus, *Cuv. & Val.* ii. p. 331; *Faun. Japon. Poiss.* p. 8; *Richardson, Ichth. China*, p. 232.

D. $\frac{11}{15-16}$. A. $\frac{3}{(7-)8}$.

Caudalis rounded; sub- and interoperculum entire; the hinder limb of the præoperculum serrated; denticulations stronger at the angle; the lower limb entire. Reddish brown, with two large blackish-brown square spots at the root of the hinder half of the dorsal fin; a third black transverse spot across the back of tail. Head, body, hinder part of dorsal fin, caudalis and analis with scattered brown spots.

Japanese, Chinese, and Cape Seas.

a. Adult. China.
b. Adult. China. Presented by J. R. Reeves, Esq.
c. Adult: stuffed. Japan.
d. Adult: stuffed. Cape Seas. Presented by Sir A. Smith.
e. Adult: stuffed. Sine patria.
f. Adult: skin. Sine patria. From Mr. Scrivener's Collection.

22. **Serranus diacanthus.**

Serranus diacanthus, *Cuv. & Val.* ii. p. 319.
—— nebulosus, *Richards.* (not *Cuv. & Val.*, nor *Bleek.*) *Ichth. China*, p. 232.
—— schihpan, *Richards. l. c.* p. 231.

D. $\frac{11}{15-16}$. A. $\frac{3}{8}$. L. lat. 90.

Caudalis rounded; eye nearly one-fifth of the length of the head; length of the head one-third of the total; suboperculum and interoperculum entire; the inferior limb of the præoperculum entire, two or three strong spinous teeth at the angle, the posterior limb strongly denticulated. Whitish or brownish (in spirits), with five darker cross-bands; sometimes clouded or spotted with dark brown, besides the cross-bands; fins, in dried specimens, with an obsolete darker edge—in specimens preserved in spirits, with a lighter edge.

Bay of Bengal; Coast of Malabar; China Seas; Louisiade Archipelago.

a. Adult. Bengal. Presented by General Hardwicke.
b. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
c. Adult. China. Presented by General Hardwicke (*Serranus schihpan*).
d. Adult. China.
e. Half-grown: bad state. China. Presented by the Hon. E.I. Company.
f. Half-grown. Hong Kong. Presented by Sir J. Richardson.
g. Half-grown. Hong Kong. From the Haslar Collection.
h. Half-grown: stuffed. Louisiade Archipelago, in 30 fathoms. Voyage of the Rattlesnake.
i. Young: stuffed. Louisiade Archipelago, in 12 fathoms (sand) Voyage of the Rattlesnake.
k. Adult. India.
l. Adult. India. From the Haslar Collection.
m. Adult. India. Presented by General Hardwicke.

23. **Serranus striatus.**

Seba, iii. t. 27. f. 9; *Parra*, p. 50. pl. 24. f. 1.
Anthias striatus, *Bl.* t. 324; *Bl. Schn.* p. 305.
Lutjanus striatus, *Lacep.* iv. p. 234.

Sparus chrysomelanurus, *Lacép.* iv. p. 160.
Anthias cherna, *Bl. Schn.* p. 310.
Serranus striatus, *Cuv. & Val.* ii. p. 288; *Guichen. in Ramon de la Sagra, Hist. Cuba, Poiss.* p. 12.

D. $\frac{11}{17}$. A. $\frac{3}{8}$. Vert. 10/14

Distance between the eyes much smaller than their diameter; præoperculum with fine denticulations (in younger individuals coarser at the angle). Caudalis rounded. Six or seven broad cross-bands; scattered circular black spots round the eye; a large square black blotch across the back of the tail, behind the dorsal.

Atlantic shores of Tropical America.

a. Very large specimen (3′ long): stuffed. America.
b. Very large specimen ($2\frac{1}{2}$′ long): stuffed. West Indies.
c. Half-grown: stuffed. Cuba. From M. Poey's Collection.
d. Half-grown. West Indies.
e. Half-grown: skeleton. West Indies.
f. Half-grown: not good state. West Indies.
g. Half-grown. West Indies.
h, i. Half-grown. West Indies. From Mr. Scrivener's Collection
k. Half-grown: stuffed. Mexico. Presented by Dr. J. E. Gray.
l. Half-grown: stuffed. Bahia.
m. Half-grown. Puerto Cabello. From Mr. Brandt's Collection.
n–r. Half-grown: skins. Jamaica. From Dr. Parnell's Collection.

Skeleton.—The occipital crest, being moderately developed behind, is prolonged to the front end of the frontal bones; the orbital edge also of the latter is prominent; the suborbital arch as in *S. scriba*. The three spines of the operculum correspond to three bony ridges, the middle of which is the strongest and slightly curved. The hinder limb of the præoperculum is rather convex, minutely serrated, and slightly notched above the angle; in young individuals the denticulations of the angle are stronger; the lower limb, sub- and interoperculum, and suprascapula are entire. There are in front of the upper jaw two feeble canines, to which two others correspond in the lower jaw; the other teeth of the upper jaw are villiform, occupying nearly the whole length of the intermaxillary; in front they are placed in many irregular series, those of the hinder series becoming gradually longer and bent backwards; the villiform band of the lower jaw occupies nearly all the length of the dental bone; we can clearly distinguish two series at the lateral part of this bone, the interior of which contains stronger teeth than the exterior. The series of vomerine teeth form a right angle; the palatines are provided only with a single series of minute teeth.

24. Serranus stigmapomus.

Richardson, Ichth. China, p. 232.

D. $\frac{9}{17}$. A. $\frac{3}{8}$.

Caudalis rounded; præoperculum finely serrated, with rather stronger denticulations at the angle. Brown, with eight regular darker cross-bands; a round black spot between the two upper opercular spines; dorsal fin with a pale edge, pectoral and anal fins with a dark one.

China Seas. North-west Coast of Australia?

b. Denticulations of præoperculum conspicuous and equal.

25. Serranus tigris.

Cuv. & Val. ix. p. 440.

D. $\frac{11}{17}$. A. $\frac{3}{11}$.

Caudalis slightly rounded; præoperculum very finely serrated. Violet, spotted with brownish; eight oblique cross-bands of a light blue colour. (*Val.*)

St. Domingo.

26. Serranus boenack.

Bodianus boenack, *Bloch*, iv. p. 44. t. 226; *Bl. Schn.* p. 330.

Serranus boenack, *Cuv. & Val.* ii. p. 362 (not good); *Bleeker, Perc.* p. 31.

—— boelang, *Cuv. & Val.* ii. p. 308, vi. p. 514; *Quoy. & Gaim. Voy. Astrol. Poiss.* p. 657. pl. 3. f. 4.

—— nigro-fasciatus, *Hombr. & Jacquin. Voy. Pôle Sud, Poiss.* p. 36. pl. 2. f. 1.

D. $\frac{9}{15}$. A. $\frac{3}{8}$. L. lat. 70.

Caudalis rounded; sub- and interoperculum with slight denticulations, præoperculum finely serrated; the diameter of the eye one-sixth of the length of the head. Brown; body with seven darker cross-bands; fins not spotted; caudalis with a black and yellow hinder edge.

Sunda and Molucca Sea.

a. Young. Amboyna. From Mr. Frank's Collection.
b. Adult: stuffed. Presented by J. Gould, Esq.

27. Serranus nigri. (Plate IX. fig. A.)

D. $\frac{9}{14}$. A. $\frac{3}{8}$. L. lat. 70.

Caudalis rounded. The height of the body is $3\frac{4}{5}$ in the total length, the length of the head $3\frac{1}{3}$; the diameter of the eye is $4\frac{1}{2}$ in the latter. The upper maxillary bone does not reach to the level of the posterior margin of the eye. Sub- and interoperculum entire; pectorals as long as ventrals, not extending to the anal fin. Brown, with seven indistinct vertical bands; cheeks, upper jaw, the soft part of the dorsal and all the other fins with more or less distinct, round, pale bluish spots of the size of a scale.

a. River Niger. From Mr. Fraser's Collection.

Description.—The form, as in most of the *Serrani*, is oblong, rather elongate; the greatest height of the body is beneath the front end of the dorsal fin, and $3\frac{4}{5}$ in the total length. Taking the distance between the dorsal and caudal fins = 1, it is contained $3\frac{2}{3}$ in the length of the base of the dorsal, and equal to one-third of the distance between dorsal and snout, and rather smaller than the base of the anal fin. The length of the head is contained $3\frac{1}{3}$ in the total; the distance between the eyes is much smaller than their diameter, covered with small scales, which extend beyond the nostrils on the præorbital. The length of the snout from the eye is rather more than the diameter of the eye; the cleft of mouth moderately oblique; the upper maxillary bone naked, not reaching to the level of the posterior margin of the eye; the mandibulary is covered with minute scales, and longer than the half of the length of the head. The posterior limb of the præoperculum is convex, minutely serrated, the denticulations at the angle being scarcely larger; the lower limb is entire, like the sub- and interoperculum. The operculum terminates in three conspicuous, flat, short, triangular teeth, the middle of which is the longest, but not very prominent; the upper one is rather more distant than the lower. The suprascapular bone is concealed by the ordinary scales.

The base of the *dorsalis* is protected by an encroachment of the scaly integument, and a tapering row of scales runs up between each pair of spines or rays for two-thirds of the height of the fin. The spinous part is lower than the soft, and the membrane between the spines is deeply notched, but without fringed appendages; the first spine is half the size of the second, the second two-thirds of the third, and the fourth to ninth spines are nearly equal in length, the last being rather shorter; all the spines are strong, and the strongest is equal in length to the distance between the dorsal and caudal fins. The soft portion of the dorsal fin is quadrangular, with a straight upper margin; the first ray is one-fourth longer than the last spine, all the following being equal, except the last three, which again diminish in length. The *caudalis* is rounded throughout, narrow bands of small scales running between the rays to two-thirds of the length of the fin. The *analis* commences a little behind the commencement of the soft portion of the dorsal; the first spine is strong, but short; the second very strong, and nearly equal in length to the dorsal spines, which it much exceeds in strength; the third is more slender and rather shorter. The posterior angle of the fin is rounded, the rays becoming gradually longer to the fifth, and diminishing again from the eighth. The *pectoralis* is composed of sixteen rays, rounded, as long as the ventral, and covered with thin scales to one-third of the length only. The *ventralis* reaches just to the vent, has the spine of the same length as the second dorsal, and the second ray rather longer than the first.

The ground-colour is brown, lighter on the belly; seven darker indistinct bands reach to the belly, and are broader than the lighter intervals between. The pale spots are most distinct on the præorbital and maxillary bones, on the anal and ventral fins, and on the inner side of the root of the pectoral; the pectoral itself is immaculate and of a brownish-grey colour. The dentition is as usual.

The specimen is five inches long.

28. Serranus semipunctatus.

? Perca septemfasciata, *Thunb. Nov. Act. Stockh.* 1793, pl. 1. f. 1.
Serranus semipunctatus, *Cuv. & Val.* ii. p. 341.

D. $\frac{11}{15}$. A. $\frac{3}{10}$.

Body with six or seven broad cross-bands; head and fins spotted; caudalis rounded.

Coast of Pondicherry.

29. Serranus tigrinus.

Seba, iii. 27. 5.
Crochilus, sp. 4, *Klein, Miss.* p.
Holocentrus tigrinus, *Bloch*, t. 237; *Bl. Schn.* p. 314.
Serranus tigrinus, *Cuv. & Val.* ii. p. 314.

D. $\frac{10}{12}$. A. $\frac{3}{8}$.

Caudalis slightly emarginated. Brown, with seven black cross-bands, and with oblong dark blotches between; head and vertical fins black-spotted; between the third and fifth spines of the dorsalis a large black spot.

(East Indies?)

30. Serranus papilionaceus.

Cuv. & Val. viii. p. 471; *Valenc. in Barker-Webb & Berthelot, Ichth.* p. 7.

D. $\frac{10}{15}$. A. $\frac{3}{8}$.

Caudalis very slightly notched; præoperculum very finely serrated behind and below; the fifth spine of the dorsal fin longest, one-half of the height of body; ventral fins reaching to the second spine of the analis. Ground-colour reddish-olive; under-side of the head and breast with violet spots; a broad olive cross-band below the hinder spines of the dorsal fin; two other narrower ones across the tail; dorsal and anal fins spotted and lineolated.

Coast of Goree; Canarian Islands.

c. Denticulations of præoperculum exceedingly fine or obsolete.

31. Serranus oxyrhynchus.

Cuv. & Val. ii. p. 321.

D. $\frac{10}{14}$. A. $\frac{3}{8}$.

Caudalis truncated; muzzle pointed. Body with seven cross-bands; a longitudinal streak from the eye to the angle of operculum, and another oblique one from thence along the edge of operculum; an oblong spot in the centre of operculum. (*Val.*)

Hab. —— ?

32. Serranus argus.

? *Renard*, fol. 2. no. 70; *Valent*. iii. p. 459. no. 159.
Cephalopholis argus, *Bl. Schn.* p. 311. pl. 61.
Serranus argus, *Cuv. & Val.* ii. p. 360.

D. $\frac{11}{16}$. A. $\frac{3}{9}$. L. lat. 95.

Caudalis rounded; præoperculum with exceedingly fine denticulations, suboperculum entire, a part of the lower edge of the interoperculum finely serrated; three spines of the operculum very conspicuous, the middle one longest; maxillary bone reaching behind the level of eye; the diameter of the eye one-sixth of the length of the head, and rather more than one-third of the total. Brown (in spirits), with reddish-brown cross-bands; head, body, and all the fins with numerous small, round, blue, dark-edged spots.

This species may be easily confounded with one of the other blue-spotted *Serrani*, but is distinguished by the cross-bands and by the denticulations of the opercles.

East Indies.

a. Fine specimen. Sine patria. From the Haslar Collection.

2. Body of uniform coloration or spotted; with neither transverse nor longitudinal bands.

a. Dorsalis with nine, rarely with eight spines.

By far the greater part of the species belonging to this group exhibit the præoperculum finely and equally denticulated, without those strong teeth on the angle by which some of the former groups are distinguished. The denticulations gradually disappear in some species. Thus we are really at a loss how to subdivide the numerous species still remaining. The best way would be to base the division on anatomical differences, if such really exist; but we must leave this task to those naturalists who are provided with more abundant materials than we are. The dentition does not offer any essential differences; nor is it practicable to apply the different coloration, as the species would then be very unequally divided, and of but little use to the naturalist, who is obliged to examine preserved and discoloured specimens. Hence we can find no other character but the number of the rays, much as we object to this method; but we obtain at least one advantage, that of facilitating the determining of species. The number of rays appears rarely to vary more than two, and on endeavouring to determine a species we must look for it in two categories: for instance, if there is a specimen with fifteen soft rays, we must look for the species in the category with fourteen to fifteen rays as well as in that with fifteen to sixteen. This method would be false if applied to other genera of fishes with many-rayed fins, where the number often differs more than five or six. A distribution according to the native countries is of little value, so long as it is unaccompanied by other characters; and is of no use at all whenever we have specimens without any notice of their origin.

a. With seventeen or eighteen soft rays.

33. Serranus rogaa.

Perca rogaa, *Forsk.* p. 38.
Bodianus rogaa, *Bl. Schn.* p. 334.
Serranus rogaa, *Cuv. & Val.* ii. p. 349; *Rüpp. Atlas*, p. 105. pl. 26. f. 1.

D. $\frac{9}{18}$. A. $\frac{3}{9}$ ($\frac{3}{10}$ *Rüpp.*).

Caudalis truncated; denticulations of the præoperculum nearly obsolete. Uniform blackish brown; fins black-edged.

Red Sea.

a. Adult: stuffed. Red Sea.

34. Serranus zananella.

Serranus zananella, *Bleeker*, *Perc.* p. 32.
? Labrus guaza, *Lacép.* iii. p. 501. pl. 27. f. 1.
? Serranus zananella, *Cuv. & Val.* ii. p. 304.

D. $\frac{9}{17}$. A. $\frac{3}{8}$. L. lat. 70.

Caudalis rounded; inter- and suboperculum entire; denticulations of the præoperculum conspicuous. Coloration uniform brown; dorsalis black-edged.

Javanese Sea.

β. With sixteen soft rays (rarely with 15–17).

35. Serranus pachycentrum.

Cuv. & Val. ii. p. 295.

D. $\frac{9}{15}$. A. $\frac{3}{8}$.

Caudalis rounded; both limbs of the præoperculum, and lower limbs of the inter- and suboperculum finely denticulated; lateral scales each with a slight keel, forming together longitudinal lines. Dried specimen uniform brown.

Ceylonese Sea.

a. Adult: skin: not good state. Ceylon. Presented by E. F. Kelaart, M.D.

36. Serranus erythræus.

Cuv. & Val. vi. p. 516.

D. $\frac{9}{16}$ A. $\frac{3}{9}$.

Caudalis rounded; denticulations of the præoperculum exceedingly fine. Uniform brownish; pectoral and caudal fins nearly black; ventrals yellowish. (*Val.*)

Isle de France.

37. Serranus microprion.

Bleeker, *Amboina*, ii. p. 552.

D. $\frac{9}{16(17)}$. A. $\frac{3}{8}$. L. lat. 75

Caudalis rounded; denticulations of the præ-, sub-, and interoperculum scarcely visible; the diameter of the eye one-fifth of the length of the head; upper maxillary bone reaching beyond the hinder margin of the eye; the second anal spine longest. Dark brown on the sides, each scale with a black speck; head with numerous small, round, blue, black-edged spots; fins immaculate.

Seas of Java, China, and Amboyna; Louisiade Archipelago.

Bleeker gives for the dorsal fin $\frac{9}{15-16}$, which number would be $\frac{9}{14-15}$ according to my way of counting the rays; but all our specimens (except one with seventeen rays) exhibit sixteen rays, one of them coming from Amboyna, and procured from a Dutch collection, with the name of *S. microprion.*

a. Adult. Amboyna. From Mr. Frank's Collection.
b. Adult. China.
c. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
d. Adult: stuffed. Louisiade Archipelago. From Mr. M'Gillivray's Collection.
e. Adult: stuffed. Louisiade Archipelago (7 fathoms, on sand and coral). Voyage of the Rattlesnake.
f. Adult: stuffed. Louisiade Archipelago (30 fathoms). Voyage of the Rattlesnake.

38. **Serranus cyanostigmatoides.**

Serranus guttatus, *Cuv. & Val.* ii. p. 357 (not *Peters*).
—— cyanostigmatoides, *Bleek. Perc.* p. 31.

D. $\frac{9}{16}$. A. $\frac{3}{9-10}$.

Caudalis rounded; sub- and interoperculum denticulated; præoperculum very finely serrated, the lower limb entire; operculum with three conspicuous spines, upper one shortest; the diameter of the eye one-sixth of the length of the head; length of the head not quite one-third of the total. Red (in life), all parts with round, blue, dark-edged spots; all the fins, except pectoral fins, dark-edged; two white streaks between eye and muzzle.

Seas of Java and Amboyna.

a. Half-grown. Amboyna. From Mr. Frank's Collection.
b. Half-grown. Amboyna. From Mr. Frank's Collection.

39. **Serranus cyanostigma.**

Renard, Poiss. Mol. t. 28. f. 153; *Valent.* iii. p. 392.
Serranus cyanostigma, (*Kuhl & v. Hass.*) *Cuv. & Val.* ii. p. 359, and *Règne Anim. Ill.* pl. 8. f. 2; *Bleeker, Perc.* p. 32.

D. $\frac{9}{16}$. A. $\frac{3}{8}$. L. lat. 75.

Caudalis rounded; sub- and interoperculum entire, præoperculum very finely serrated; the diameter of the eye $6\frac{1}{2}$ in the length of the head. Red (in life), with numerous small, round, blue, darker-edged spots on the head and fins; fins blue-edged.

Javanese Sea.

Peters (*Wiegm. Archiv*, 1855, p. 235) unites *S. cyanostigma* and the following species.

a. Adult. Amboyna. Purchased of Mr. Frank.

40. Serranus miniatus.

Perca miniata, *Forsk.* p. 41. no. 41.
Diacope miniata, *Cuv. & Val.* ii. p. 433.
Serranus miniatus, *Rüpp. Atl. Fische*, p. 106. t. 26. f. 3.

$$D. \frac{9}{15-17}. \quad A. \frac{3}{9-10}.$$

Closely allied to *S. guttatus*. Caudalis rounded; præoperculum very finely serrated, and with a rather decided notch above the angle. Red (in life), covered with small, blue, black-edged rings; pectoral and anal fins immaculate; no fin with a coloured edge. (*Rüpp.*)

Red Sea; Mozambique.

a. Half-grown: stuffed: discoloured. Sine patria. Old Collection.

γ. With fifteen (rarely with fourteen) rays.

41. Serranus aurantius.

Cuv. & Val. ii. p. 305; *Bleek. Sum.* i. p. 571.

$$D. \frac{9}{14-15}. \quad A. \frac{3}{8}. \quad \text{L. lat. } 85.$$

Caudalis rounded; the diameter of the eye is 5 or 5½ in the length of the head; upper maxillary bone just reaching the posterior margin of the eye; denticulations of the præoperculum feeble, of the sub- and interoperculum conspicuous. Red; head and front part of back punctulated with brown; the soft part of the dorsal fin and caudalis with a black and yellow edge, the anal fin with a black one.

Seychelles; Sumatra.

42. Serranus sexmaculatus.

Rüppell, Atl. Fische, p. 107.

$$D. \frac{8}{15}. \quad A. \frac{3}{10}.$$

Closely allied to *S. miniatus*. Caudalis rounded. Red (in life), covered with small, blue, black-edged rings; six blackish blotches along the base of dorsal fin. (*Rüpp.*)

Red Sea.

43. Serranus nigripinnis.

Bleeker, Batjan, iii. p. 500; (? *Cuv. & Val.* ii. p. 339.)

$$D. \frac{9}{14-15}. \quad A. \frac{3}{8-9}. \quad \text{L. lat. } 100. \quad (\text{B. } 7.)$$

Caudalis rounded. The diameter of the eye one-fifth of the length of the head; the upper maxillary bone reaching to below the posterior half of the eye; præoperculum finely serrated, with rather stronger denticulations at the angle; sub- and interoperculum serrated; the posterior dorsal spines nearly equal in length, longer than the anterior ones; the second anal spine stronger but not longer than the third. Brownish; head and anterior part of the back with numerous small bluish spots, the posterior part of the body with more distant brown spots; the soft part of the dorsal fin, the caudal and anal fins spotted; the caudal and pectoral fins yellow-edged. (*Bl.*)

Sea of Batjan.

44. Serranus hemistictus.

Rüppell, Atlas, p. 109. t. 27. f. 3.

(B. 6.) D. $\frac{9}{14}$. A. $\frac{3}{9}$.

Caudalis rounded; præoperculum rounded, with very fine and obsolete serrature; the last dorsal spine longest. Dark olive; head, belly, and fins with small blue spots, those of the operculum black-edged; caudal, anal, and ventral fins with a whitish edge.

Rüppell gives fourteen or fifteen rays for the dorsal fin, and six branchiostegals only.

Red Sea.

a. Adult: stuffed. Red Sea.

45. Serranus guttatus.

Percæ miniatæ var. B., *Forsk.* p. 41.
Renard, i. pl. 20. f. 3, pl. 30. f. 162; *Valent.* iii. p. 358. f. 37.
Bodianus guttatus, *Bl.* t. 224; *Bl. Schn.* p. 330.
Serranus myriaster, *Cuv. & Val.* ii. p. 365; *Rüppell, Atlas,* p. 107. t. 27. f. 1; *Richards. Ichthyol. China,* p. 233; *Quoy & Gaim. Voy. Astrol.* pl. 3. f. 1; *Less. Voy. Coquille,* pl. 37; *Bleek. Natuurk. Tydschr. Nederl. Indie,* vi. p. 192; *Quoy & Gaim. Voy. Astrol. Poiss.* p. 653. pl. 3. f. 1.
Serranus guttatus, *Peters, Wiegm. Arch.* 1855, p. 235 (not *Cuv. & Val.*).

D. $\frac{9}{15}$ ($\frac{9}{16}$ *C. & V., Rüpp.*). A. $\frac{3}{8-9}$.

Caudalis rounded; denticulations of the præoperculum obsolete; its posterior limb not emarginate. Brownish black; head, body, and all the fins with round, blue, black-edged spots; caudalis, analis, and the hinder half of the dorsalis white-edged.

According to Bleeker's description, the fins do not appear to be blue-spotted (probably a variety). The denticulations of the præoperculum are entirely absent according to Rüppell's description, but they are conspicuous in the figure given by the same naturalist. After having removed the skin, I find very small teeth at and above the angle.

Red Sea; Isle de France; Coast of Mozambique; Ceylon; China Seas; Borabora; Australia; Polynesia; Sandwich Islands.

a, b. Large specimens: stuffed. Isle de France.

c. Adult: bad skin. Ceylon. Presented by Dr. Kelaart.
d. Young. Borneo. From Mr. Frank's Collection.
e. Young: bad skin. From Gronov's Collection.

46. Serranus ouatalibi.

Parra, p. 30. pl. 5. f. 2; *Margr.* p. 147 (Carauna); *Licht. Berl. Abhandl.* 1820, p. 278.
Bodianus guativere, *Bl. Schn.* p. 336.
Gymnocephalus ruber, *Bl. Schn.* p. 346. pl. 67.
Serranus ouatalibi, *Cuv. & Val.* ii. p. 381; *Guichen. in Ramon de la Sagra, Hist. Cuba, Poiss.* p. 15.
—— carauna, *Cuv. & Val.* ii. p. 384; *Castelnau, Anim. nouv. ou rares de l'Amér. du Sud, Poiss.* p. 1. pl. 1. f. 1 (faulty).

D. $\frac{9}{15}$. A. $\frac{3}{9}$. L. lat. 85. Cæc. pylor. 8. Vert. 10/14.

Caudalis rather truncated; sub- and interoperculum very slightly denticulated where they are joined; præoperculum serrated, teeth of the angle not prominent, lower limb entire; the upper spine of the operculum largest and longest. Maxillary bone not reaching to the level of the hinder edge of the eye; diameter of the eye $5\frac{1}{2}$ in the length of the head; length of the head $3\frac{1}{4}$ in the total. Red (in life); head and body, and sometimes dorsal fin, covered with numerous small, blue, black-edged spots, a pair of larger black spots on the symphysis of the lower jaw, and another on the back of the tail, behind the dorsalis.

Caribbean Sea.

a. Adult: stuffed. West Indies.
b. Adult: female. West Indies.
c–e. Adult. West Indies.
f. Adult: not good state. West Indies.
g. Half-grown. West Indies. Old Collection as *Perca atomaria.*
h. Adult: stuffed. West Indies. From Mr. Scrivener's Collection.
i. Adult. S. America. Presented by Sir R. Schomburgk.
k–r. Half-grown: stuffed. West Indies. From Mr. Scrivener's Collection.
s–x. Half-grown: skins. Jamaica. From Dr. Parnell's Collection.
y, z. Adult: stuffed. Lord Howe's Island. Voyage of H.M.S. Herald.—With the formula: D. $\frac{9}{14}$. A. $\frac{3}{8}$.
α. Adult: bad skin. Cape Verde.
β. Intestines and ovarium of spec. *b.* Both halves of the ovarium are nearly entirely separated.

Skeleton.—The upper surface of the skull is rounded on both sides, with a very low horizontal branch of the occipital crest between, not extending on the frontal bones; the space between the orbits is concave, with a deep, oblong, triangular groove in front. The posterior part of the orbit is strongly elevated; the interior orbito-scapular ridge is feeble, but projecting behind into a strong spine; the exterior is very broad and strong, covered by the skin only.

The upper maxillary bone without process and with nearly straight-lined margins. Operculum with three very acute prominent spines, the upper two of which are longest, and much more distant from one another than the middle from the lower; the præoperculum rounded throughout, with very fine and equal denticulations at the posterior limb; sub- and interoperculum entire. The dentition is the same as in *S. coronatus*, but the posterior front teeth of the upper jaw are not quite so long as in that species. There are ten abdominal and fourteen caudal vertebræ. The first interhæmal spine is equal to the length of the second to the seventh vertebra, and attached to the hæmal of the first caudal verte' ra.

Castelnau (*l. c.* pl. 1. f. 3) gives a tolerably good figure of a fish named *Serranus ouatalibi*, but certainly different from it. The figure being unaccompanied by a proper description, we are unable to determine the species from it alone.

47. Serranus tæniops.

Seba, iii. 27. 6.
Serranus tæniops, *Cuv. & Val.* ii. p. 370.

D. $\frac{9}{15}$. A. $\frac{3}{9-10}$. Cæc. pylor. 7. Vert. 10 14.

Caudalis rounded. The height of the body is one-fourth of the total length; the length of the head is $3\frac{1}{3}$ in the same length; the diameter of the eye nearly one-sixth of the length of the head; the upper maxillary bone reaching behind the level of the posterior margin of the eye. Denticulations of the præoperculum conspicuous. Red (in life); head, body, and fins with numerous small, round, blue, black-edged spots; between eye and muzzle two dark-blue streaks; fins blue-edged.

Atlantic, between Africa and Tropical America.

a. Adult. St. Vincent's. Presented by the Lords of the Admiralty.
b. Adult. Atlantic. From the Haslar Collection.
c. Adult. Atlantic. From the Haslar Collection.
d. Adult. Atlantic. From the Haslar Collection.
e. Adult: male: skeleton. Atlantic. From the Haslar Collection.
f. Adult. S. Africa. From Mr. Stevens's Collection.

Skeleton.—The paroccipital and parietal bones form together a slight convexity, whilst the space between the orbital margins is rather concave; the ridges are slightly developed; the posterior part of the occipital crest is oblong, quadrangular, higher than long, and emits a low longitudinal branch along the medial line of the upper part of the supraoccipital bone, but which does not extend on the frontals. The suprascapula is evidently separated into two bones—an interior, which articulates with the exoccipital; and an outer one, articulating with the mastoid bone; from both articulations run parallel longitudinal ridges to the orbit; the interior one is very inconspicuous in this species, but is strongly developed in *S. undulosus*; the exterior ridge is not high, but very strong. The maxillary bone gradually widens from the front towards behind, and is moreover distinguished by a prominent triangular process at the hinder, lower angle. The præoperculum has a rounded angle and rather convex limbs, the posterior of which is minutely serrated; the operculum with three long, pointed, very prominent spines, and deep notches between, the upper one more distant and the middle one rather longer; the sub- and interoperculum are serrated, the former along the anterior half of its length, and produced into an elongate point behind. There are, above and beneath, two pairs of strong canine teeth; otherwise the dentition is very similar to that of *S. coronatus*, except in the posterior front teeth being much shorter. The first interhæmal spine is of moderate development, being equal to the length of the first six vertebræ; it is fixed to the hæmal of the eleventh vertebra.

48. Serranus sonnerati.

Perca rubra, *Sonnerat.*
Serranus sonnerati, *Cuv. & Val.* ii. p. 299.

D. $\frac{9}{14-15}$. A. $\frac{3}{9}$.

Caudalis rounded; præoperculum with a few obsolete denticulations. Uniform brownish (in spirits); head, in life, with reticulated blue lines.

Coasts of Pondicherry, Ceylon, and Sumatra; Louisiade Archipelago.

a. Adult. Sumatra. From Mr. Frank's Collection.
b, *c*. Half-grown: stuffed. Louisiade Archipelago. From the Voyage of the Rattlesnake.

49. Serranus urodelus.

Perca urodela, *Forst. Descr. Anim. Cur. Lichtenst.* p. 221.
Serranus urodelus, *Cuv. & Val.* ii. p. 306, vi. p. 513; *Bleek. Kokoseilanden,* p. 39.

D. $\frac{9}{15}$. A. $\frac{3}{8}$. L. lat. 85.

Caudalis rounded. Sub- and interoperculum slightly denticulated where they are joined; præoperculum entire below, finely serrated behind; operculum with three conspicuous spines. Maxillary bone reaching far behind the level of the eye; the diameter of the eye one-sixth of the length of the head; length of the head one-third of the total. Uniform brown (in spirits); hinder half of the dorsal fin, caudalis, and analis with pale (in life red and blue) spots; caudalis with two oblique whitish bands, convergent posteriorly.

Amboyna; Caroline and Kokos Islands.

a. Large specimen. India.
b. Adult. Amboyna. From Mr. Frank's Collection.

50. Serranus analis.

Cuv. & Val. ii. p. 307, vi. p. 514; *Less. Voy. Coq. Zool.* ii. p. 235.

D. $\frac{9}{15}$. A. $\frac{3}{8}$.

Caudalis rounded. Denticulations of the præoperculum very fine. Uniform whitish; vertical fins black-edged. (*Val.*)—[Lesson mentions only thirteen soft rays of the dorsal fin.]

New Ireland.

51. Serranus zanana.

Serranus zanana, *Cuv. & Val.* ii. p. 339.
Serranus spilurus, *Cuv. & Val.* ix. p. 433; *Bleek. Floris*, p. 322.

D. $\frac{9}{14-15}$. A. $\frac{3}{8-9}$. L. lat. 65.

Caudalis rounded. The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $3\frac{1}{5}$; the diameter of the eye is one-fourth of the length of the head; upper maxillary bone reaching beyond the hinder margin of the eye; præoperculum minutely serrated, suboperculum entire, interoperculum scarcely denticulated behind; lateral line very convex, nearest to the sixth, seventh and eighth dorsal spines; the posterior six dorsal spines nearly equal in length, the second anal spine longest and strongest. Brownish grey, marbled with darker; four large, oblong, dark spots along the base of the dorsal; on the back of the tail behind the dorsal a round, black, white-edged spot, behind which is another smaller one. Across the posterior margin of the caudal a black band.

a. Half-grown. Amboyna. From Mr. Frank's Collection as *Serranus spilurus*.
b. Half-grown: stuffed. Sine patria.

There can be little doubt of the identity of the specimens described by Valenciennes under two names. But the fish described by Bleeker may prove to be a different species; his fish is covered with small blue spots, and anteriorly punctulated with brown; he does not mention, also, the deep-coloured dorsal blotches, which may disappear in dried specimens, but certainly not in those which are preserved in spirits.

δ. With fourteen (rarely with fifteen) rays.

52. Serranus leopardus.

Labrus leopardus, *Lacép.* iii. p. 517. pl. 30. f. 1.
Serranus leopardus, *Cuv. & Val.* ii. p. 336.

D. $\frac{9}{14}$. A. $\frac{3}{9}$.

Caudalis rounded; præoperculum very finely denticulated. Coloration of dried specimens: pale round spots all over the body, more numerous on the head, chest, and belly; a brown temple-streak with a darker spot behind; on the back of the tail, behind the dorsal, one or two black spots; caudalis with two oblique bands; a series of spots between the dorsal spines, and two series between the rays. (*Val.*)

Hab. —— ?

53. Serranus coronatus.

Perca guttata, *Bl.* t. 312.
Sparus cruentatus, *Lacép.* iv. p. 157. pl. 4. f. 1.
Serranus coronatus, *Cuv. & Val.* ii. p. 371.
—— nigriculus, *Cuv. & Val.* ii. p. 375; *Guichen. in Ramon de la Sagra, Hist. Cuba. Poiss.* p. 14.
—— guttatus, *Castelnau, Animaux nouveaux, Poissons*, p. 1.

D. $\frac{9}{14}$. A. $\frac{3}{8}$. L. lat. 60. Cæc. pylor. 6. Vert. 9/15.

Caudalis rounded. Denticulations of the præoperculum very fine, sometimes obsolete; diameter of the eye one-sixth of the length of the head; length of the head not quite one-third of the total. Pectorals nearly reaching to the front end of the anal fin; the upper maxillary bone reaching beyond the level of the posterior margin of the eye. Brownish or brown (in spirits); on the head constantly numerous round whitish spots, sometimes occupying the anterior half or two-thirds of the body (*S. nigriculus*), or obsolete on the trunk, and replaced by distant dark-brown (in life violet) spots; fins with very numerous small brown spots. Back sometimes with a series of three or four small, round, black spots along the base of the dorsal fin.

Caribbean Sea; Gulf of Mexico; Coast of Brazil.

a. Adult. S. America. Presented by Sir R. Schomburgk.
b. Adult. Puerto Cabello. From Mr. Brandt's Collection.
c. Half-grown. W. Indies.
d. Half-grown: skeleton. W. Indies.
e. Adult. W. Indies.
f. Adult. W. Indies. From the Haslar Collection.—With only seven dorsal spines.
g. Adult. Cuba. Presented by the Zoological Society.
h, *i*. Adult: skins. Jamaica. From Dr. Parnell's Collection.
k. Adult: skin: bad state. Trinidad. Presented by J. B. Richardson, Esq.
l, *m*. Adult: stuffed. W. Indies. From Mr. Scrivener's Collection.

Var. NIGRICULUS.

m. Adult. S. America. Presented by Sir R. Schomburgk.
n–s. Adult: stuffed. W. Indies. From Mr. Scrivener's Collection.

Skeleton.—The skeletons of the numerous species of *Serranus* are very similar to one another: the configuration of the bones forming the roof of the skull, the opercular pieces, and the maxillary bone, exhibit slight differences, of no importance in systematical arrangement, and difficult to be clearly described. In this species the upper part of the skull does not bear very prominent ridges; a slight longitudinal crest runs from the supraoccipital to the hinder end of the suture between the frontal bones, which are slightly swollen, and rather elevated above the level of the occipital; the space between the orbits is slightly concave, filled up by two divergent, rounded ridges of the frontal bones. The maxillary bone is widened behind, with straight superior and inferior margins. The præoperculum is rounded throughout, with excessively fine denticulations at the posterior limb. Operculum with three conspicuous spines nearly of equal size, the two lower ones nearer together. Wherever the denticulations of the præoperculum are as minute as in this species, the sub- and interoperculum have always an entire margin. There are in front of the upper jaw two canines of moderate size, corresponding to two pairs of the lower; the other teeth occupy, in a broad band, all the length of the intermaxillary, those in the outer series being rather stronger; the interior front teeth are excessively long, one being nearly equal to the distance between the eyes. The teeth of the mandibula reach to the end of the dental bone, being arranged posteriorly in a single series, and further in front in two series; the strongest teeth are in the middle of the side of the dental bone and in front. The series of the vomerine teeth form a right angle; those of the palatine are minute, in a single series, and do not reach to the posterior end of this bone. As the second spine of the anal fin is very strong, so is its interhæmal correspondingly developed; it is fixed to the hæmal spines of the ninth and tenth vertebræ, and is as long as the first seven vertebræ together.

ε. With twelve rays.

54. Serranus spiloparœus.

Cuv. & Val. ii. p. 338.

D. $\frac{9}{12}$. A. $\frac{3}{8}$.

Caudalis rounded; denticulations of the præoperculum very fine. Brown, with darker rounded spots on the head, obsolete on the body; fins without spots and streaks. (*Val.*)

Hab. ——?

b. Dorsalis with ten or eleven (rarely with twelve) spines.

[As in the preceding group with nine spines in the dorsal fin, I also divide this according to the number of the soft rays in the same fin, and refer to what I have there said. Most of the species have stronger denticulations on the angle of the præoperculum, whereby they are still more distinguished from those of the preceding group.]

a. With eleven or twelve rays.

55 Serranus limbatus.

Cuv. & Val. ii. p. 307

D. $\frac{10}{11}$. A. $\frac{3}{9}$.

Caudalis truncated. Præoperculum denticulated, and with a slight notch above the angle; interoperculum without any protuberance. Uniform whitish; dorsal fin black-edged. (*Val.*)

Island of Guam

56. Serranus nouleny.

Cuv. & Val. ii. p. 247.

D. $\frac{11}{12}$. A. $\frac{3}{8}$.

Præoperculum with fine denticulations, those of the angle rather stronger; scapula very conspicuously denticulated. Coloration uniform. (*Val.*)

Coast of Coromandel.

β. With thirteen or fourteen rays.

57. Serranus lutra.

Cuv. & Val. viii. p. 474.

D. $\frac{11}{13}$. A. $\frac{3}{8}$.

Caudalis rounded. Operculum with only one spine behind. Yellowish olive, marbled with blackish; a black spot on the back of the tail behind the dorsal fin. (*Val.*)

Isle de France.

58. Serranus goldmanni.

Bleeker, Natuurk. Tydschr. Nederl. Indie, ix. p. 434.

D. $\frac{11}{13-14}$. A. $\frac{3}{8}$. L. lat. 85.

Caudalis rounded; the diameter of the eye is $4\frac{1}{2}$ in the length of the head; the upper maxillary bone reaching beyond the posterior margin of the eye. Præoperculum serrated, with rather stronger denticulations at the angle; sub- and interoperculum entire; operculum with three points, the middle of which is the longest; the fourth, fifth and sixth dorsal spines longest; the second anal spine longer than those of the dorsal fin, nearly half the height of the body. Greenish, head and body punctulated with brownish; head and anterior part of the back marbled with brown above; the back of the tail with a black half-ring; all the fins irregularly and thickly dotted with brown, and, the pectorals excepted, edged with black. (*Bl.*)

Sea of Groot-Oby.

59. Serranus pavoninus.

Cuv. & Val. vii. p. 443.

D. $\frac{10}{13}$. A. $\frac{3}{8}$.

Caudalis truncated; muzzle pointed; præoperculum ?. Reddish; beneath the first four dorsal rays a round black spot, encircled by a white ring; caudal fin with a vertical black line at the base. (*Val.*)

Bombay.

γ. With fourteen or fifteen rays.

60. Serranus angularis.

Cuv. & Val. ii. p. 353.

D. $\frac{11}{15}$. A. $\frac{3}{8}$.

Caudalis truncated; angle of the præoperculum with four or five very strong and broad spinous teeth; interoperculum with some denticulations. Whitish, spotted with olive; vertical fins with brown spots.

Isle de France: Ceylon.

a. Adult: stuffed. Isle de France.

61. **Serranus suillus.**

Russell, pl. 127.
Bola coioides, *Buchanan Hamilton*, pp. 82, 369.
Serranus suillus, *Cuv. & Val.* ii. p. 335; *Bleeker, Verhand. Bat. Genootsch.* xxii. p. 9.
Serranus coioides, *Cant. Catal.* p. 11.

D. $\frac{11}{15}$. A. $\frac{3}{8}$.

Caudalis rounded; angle of the præoperculum with very strong spinous teeth. Head, body, and fins greyish, with large round orange spots, those of the dorsal fin sometimes confluent into longitudinal bands.

Coast of Coromandel; Bay of Bengal; Gangetic estuaries; Java Philippines.

a. Young. Philippines.

62. **Serranus fuscoguttatus.**

Percæ summanæ var. *b, Forsk.* p. 42.
Serranus fuscoguttatus, *Rüppell, Atl. Fische*, p. 108. t. 27. f. 2; *Peters, Wiegm. Arch.* 1855, p. 235.

D. $\frac{11}{14-15}$. A. $\frac{3}{8-9}$.

Caudalis rounded. Denticulations of the præoperculum stronger at the angle. Light brown, marbled with darker, and covered with rounded blackish-brown spots; a large black blotch behind the dorsal fin across the back of the tail. (*Rüpp.*)

Red Sea; Coast of Mozambique. (Port Essington ?)

a. ? Adult: skin: not good state. Port Essington. "Rock-Cod" of the Colonists.

63. **Serranus altivelioides.**

Bleeker, Perc. p. 38.

D. $\frac{11}{15}$. A. $\frac{3}{8}$. L. lat. 86.

Caudalis rounded. The length of the head is $3\frac{1}{5}$ in the total; diameter of the eye one-fifth of the length of the head; the upper profile of the head rather convex; sub- and interoperculum entire. Yellowish; head, body, and all the fins with small round brown spots. (*Bl.*)

Sea of Batavia.

64. **Serranus polyphekadion.**

Bleeker, Perc. p. 39, and *Java,* p. 417.

D. $\frac{11}{15}$. A. $\frac{3}{8}$. L. lat. 80–85.

Caudalis rounded. The length of the head is $3\frac{1}{3}$–$3\frac{1}{4}$ in the total, and the diameter of the eye $5\frac{1}{2}$ in the length of the head; upper profile of the head rather convex; maxillary bone reaching behind the level of the eye. Præoperculum with stronger denticulations on the angle, sub- and interoperculum entire. The fifth and sixth spines of the dorsal fin and the third spine of the anal longest. Rose-coloured in life, darker on the back; above with numerous deep brown and yellow specks, beneath with brown spots; all the fins punctulated with brown.

Sea of Batavia.

a. Adult: not good state. Sine patria. Old Collection.

65. **Serranus salmonoides.**

Holocentrus salmonoides, *Lacép.* iii. pl. 34. f. 3.
Serranus salmonoides, *Cuv. & Val.* ii. p. 343.
—— luti, *Cuv. & Val.* ii. p. 363 (not synon.); *Lefebvre, Voy. Abyss. Zool.* p. 230; *Poiss.* pl. 5. f. 2.
? Serranus polypodophilus, *Bleeker, Perc.* p. 37.

D. $\frac{11}{15}$. A. $\frac{3}{8}$. L. lat. 90.

Caudalis rounded. The length of the head is three times in the total; the diameter of the eye $5\frac{1}{2}$ in the length of the head; the upper maxillary bone reaching a little behind the posterior margin of the eye; præoperculum with rather coarse denticulations at the angle; sub- and interoperculum entire; upper profile of the head rather convex. Brownish yellow, marbled with darker; head and body with blackish and yellowish round spots; all the fins with rounded black and whitish spots.

Sea of Batavia; Isle de France; Red Sea.

a. Adult: stuffed. Isle de France. From Dr. Janvier's Collection.
b. Adult: stuffed. Red Sea.
c. Half-grown. India. From the Haslar Collection.
d, e. Half-grown and young. India. From the Haslar Collection.

The cross-bands mentioned by Valenciennes are nothing more than darker blotches of more or less regular shape.

66. **Serranus epistictus.**

Temm. & Schleg. Faun. Japon. p. 8; *Bleek. Verhand. Batav. Genootsch.* xxvi. p. 60. pl. 2. f. 1.

D. $\frac{11}{14\text{–}15}$. A. $\frac{3}{8\text{–}9}$. L. lat. 95.

The height of the body is four times in the total length, the length of the head $4\frac{1}{2}$; the diameter of the eye is $4\frac{1}{3}$–$4\frac{1}{4}$ in the latter. The upper maxillary reaches somewhat beyond the posterior margin of the eye. Præoperculum with coarser denticulations at the angle; sub- and interoperculum slightly denticulated. The third dorsal spine to the seventh nearly equal in length, and $2\frac{2}{3}$ in the depth of the body. Caudal fin rounded; the second and third anal spines nearly equal in length. Brownish, with four series of distant, small black spots; the vertical fins with similar spots; the spinous dorsal black-edged.

Japanese Sea

67. **Serranus bataviensis.**

Bleeker, Perc. p. 38.

D. $\frac{11}{15}$. A. $\frac{3}{8}$. L. lat. 80.

Caudalis rounded. Length of the head three times in the total; the diameter of the eye $5\frac{1}{3}$ in the length of the head; upper profile of the head rather convex; sub- and interoperculum entire. Brownish, sides reticulated with black and greyish; vertical fins with a blackish edge and lighter spots; ventral and pectoral fins immaculate.

Javanese Sea; Amboyna.

a. Adult. Java.
b. Half-grown. Amboyna. From Mr. Frank's Collection.

68. **Serranus alboguttatus.**

Cuv. & Val. ii. p. 366 (?); *Bleeker, Amboina,* iii. p. 13.

D. $\frac{11}{14-14}$. A. $\frac{3}{8}$. L. lat. 75.

Caudalis rounded. Length of the head one-third of the total; diameter of the eye $3\frac{1}{2}$ or 4 in the length of head; denticulations of the angle of the præoperculum strongest; suboperculum entire, interoperculum with two or three denticulations; the spinous part of the dorsal fin scarcely lower than the soft; the hinder nine spines nearly equal in length; the second spine of the analis longest, $2\frac{1}{3}$ in the length of the head. Blackish brown, with small, round, light blue spots; pectoral fins orange-coloured, punctulated with brown; the other fins blackish brown with pearl-coloured specks; vertical fins with a whitish edge.

Amboyna.

a, b. Young. Amboyna. From Mr. Frank's Collection

69. **Serranus polystigma.**

Bleeker, Sumatra, ii. p. 2.

D. $\frac{11}{15}$. A. $\frac{3}{8}$. L. lat. 80.

Caudalis rounded. The length of the head is $3\frac{1}{2}$ in the total; the diameter of the eye $4\frac{1}{2}$–5 in the length of the head; denticulations of the angle of the præoperculum strongest, sub- and interoperculum entire; the spinous part of the dorsal fin lower than the soft, the middle spines longest; the second spine of the anal fin one-third of the length of the head. Brownish; all parts covered with blue specks, smaller than the scales; vertical and pectoral fins with an orange edge. (*Bl.*)

Sea of Amboyna.

70. Serranus maculatus.

Perca maculata, *Bl.* t. 313 (bad).
Sparus atlanticus, *Lacép.* iv. p. 158. pl. 5. f. 1.
Serranus catus, *Cuv. & Val.* ii. p. 373; *Guichen. in Ramon de la Sagra, Hist. Cuba, Poiss.* p. 13.
Serranus maculatus, *Bleek.*, is another species: cfr. no. 17.

D. $\frac{11}{14}$. A. $\frac{3}{8}$.

Caudalis rounded; præoperculum very finely serrated, sub- and interoperculum entire. Head not quite one-third of the total length; the third spine to the sixth of dorsal fin, and the second of the anal longest. Dried specimen light brown; head and body with rounded yellowish spots, each with a brown centre; fins immaculate, the vertical ones with a blackish edge.

Cuvier gives seventeen soft rays for the dorsal fin.

Martinique.

a. Adult: stuffed. West Indies.

71. Serranus galeus.

Müll. & Trosch. in Schomburgk's Reisen in Brit. Guiana, p. 621.

D. $\frac{11}{15}$. A. $\frac{3}{9}$.

Caudalis rounded. The length of the head is $3\frac{1}{4}$ in the total; the diameter of the eye is $6\frac{1}{3}$ in the length of the head, and much smaller than the distance between the eyes; maxillary bone reaching far behind the eye; præoperculum with fine serrature, rather stronger on the angle; sub- and interoperculum entire; the spinous part of the dorsal fin low, the third to the eleventh spine nearly equal in length; the third spine of the anal fin longer than the second. Brown, marbled with darker; head, anterior part of body and pectoral fins with scattered blackish-brown spots; spots of the other fins obsolete.

Coast of Brazil.

a. Adult. South America. Presented by Sir R. Schomburgk.

72. Serranus niveatus.

Cuv. & Val. ii. p. 380; *Castelnau, Anim. nouv. ou rares de l'Amér. du Sud, Poiss.* pl. 1. f. 2.

D. $\frac{11}{14}$. A. $\frac{3}{9}$.

Caudalis rounded; præoperculum strongly serrated, with the angle rather produced backwards. Brownish olive, with small scattered spots of light blue; fins immaculate; a large quadrangular black spot on the back of tail.

Coast of Brazil.

73. **Serranus margaritifer.** (Plate IX. fig. B.)

D. $\frac{11}{14}$. A. $\frac{3}{9}$. L. lat. 85.

Caudalis truncated. The height of the body is equal to the length of the head, and $3\frac{1}{3}$ in the total; the diameter of the eye is one-fifth of the length of the head. Præoperculum finely serrated behind, with some coarse and obtuse teeth at the angle, and a single one on the lower limb, not directed forward; sub- and interoperculum minutely serrated. Ventrals reaching to the origin of the anal fin, pectorals shorter. Reddish olive, with four series of pearl-coloured spots of moderate size. A broad black blotch crossing the back of the tail.

a. Adult. South America. Presented by Sir R. Schomburgk.

Description.—The body is rather elevated; its greatest height is between the base of the dorsal and pectoral fins, equal to the length of the head, and contained $3\frac{1}{3}$ in the total. Taking the distance between the dorsal and caudal fins $= 1$, it is contained $4\frac{1}{2}$ in the length of the base of the dorsal, and $1\frac{1}{2}$ in the base of the anal, and is nearly equal to one-third of the distance between the dorsal fin and the snout. The distance between the eyes is scarcely more than the diameter of the eye, and covered with scales, which extend forward beyond the nostrils, on the præorbital, and in a narrow band on the upper maxillary bone. The length of the snout from the eye is more than the diameter of the eye. The upper maxillary bone does not reach to the level of the posterior margin of the eye. The mandibulary is covered with minute scales, and is longer than one-half of the length of the head. The lips are thick and fleshy. The posterior limb of the præoperculum is nearly straight, minutely serrated, with very coarse denticulations at the angle; there is a single strong and obtuse spinous tooth on the lower limb, at some distance from the other teeth, half concealed in the skin, and pointing downwards. The sub- and interoperculum exhibit a serrature near their meeting angles; the operculum terminates in three conspicuous, flat, triangular teeth, the upper of which is the most distant, the middle the longest, but not very prominent, and the lower the shortest and the most feeble. The suprascapular bone is concealed by the ordinary scales.

The base of the *dorsalis* is nearly free, but a tapering row of scales runs up between each pair of spines and rays to half the height of the fin. The spinous portion is rather lower, but longer than the soft, and has a convex upper margin; the membrane between the spines is deeply notched, and there is behind the top of each spine a small membranaceous appendage. The first spine is the shortest, half the size of the second; the second two-thirds the length of the third; the fourth, fifth and sixth are longest; and then the spines become gradually shorter, except the last, which is again scarcely longer than the preceding. The soft portion exhibits an entirely rounded upper margin, the rays becoming longer from the first to the sixth, and shorter from the seventh to the last; the first ray is one-fourth longer than the preceding spine. The *caudalis* is truncated; but when spread out, it exhibits a rather convex posterior margin with angular lobes. The *analis* commences a little behind the commencement of the soft dorsal portion, and terminates a little before the end of the dorsal; the first spine is not very strong and short, the second thick and strong, the third more slender, but rather longer, and equal to the second dorsal spine. The margin of the fin is rounded throughout, the second ray being the longest, and the posterior ones becoming gradually shorter. The *pectoralis* is composed of eighteen rays, rounded, shorter than the ventral, and covered with minute scales to one-third of the length only. The *ventralis* reaches to the origin of the anal, the first and second spines being rather long and pointed; the other rays diminish gradually in length; the length of the spine is equal to that of the third dorsal spine. The canine teeth are of moderate length; those of the lower jaw rather small.

The ground-colour is reddish olive, lighter on the belly; on each side of the body are four series of pearl-coloured spots, each occupying the place of five or six scales. The uppermost series reaches from the occiput along the base of the dorsal fin to the black blotch of the tail, and is composed of eight spots; the second, following the lateral line, of six; the third, from the angle of operculum, of four; and the fourth, from the base of the pectorals, of five. There is a blackish streak behind the maxillary bone. The black blotch on the tail occupies nearly the whole space between the dorsal and caudal fins and between the two lateral lines. The fins are nearly unicoloured; a single pearl-coloured spot is to be seen on the seventh spine and on the ventral fins; the anal has a whitish edge; ventrals blackish, with whitish lateral margin; pectorals uniform yellowish.

Length of the specimen 11½ inches.

This species very much resembles the *S. tsirimenara*, Faun. Japon. p. 7. pl. 4*a*. f. 3, which is said to be common in Japan, and to have sixteen soft rays in the dorsal fin. Still more remarkable is it that the same plate in that work represents another fish, *S. octocinctus*, so similar to a West Indian fish, *S. mystacinus*, that they cannot be separated. I have sufficient proof that the native country of the specimens in the British Museum is correctly stated.

δ. With fifteen or sixteen rays.

74. Serranus gigas

Perca gigas, *Brünnich, Pisc. Mass.* p. 65. no. 81.
Holocentrus gigas, *Bl. Schn.* p. 322; *De la Roche, Ann. Mus.* xiii. p. 318.
—— mérou, *Lacép.* iv. p. 377; *Risso, Ichthyol. de Nice*, p. 289.
Serranus gigas, *Cuv. & Val.* ii. p. 270; *Expéd. Sc. Morée, Zool.* pl. 16. f. 1; *Guichen. Explor. Sc. Algér. Poiss.* p. 35.

Serranus marginatus, *Lowe, Proc. Zool. Soc.* 1833, p. 142.
—— fimbriatus, *Lowe, Trans. Cambr. Philos. Soc.* 1836, p. 195. pl. 1; *Valenc. in Barker-Webb & Berthelot, Ichthyol.* p. 8.
—— caninus, *Valenc. l. c.* p. 10.

D. $\frac{11}{15-16}$. A. $\frac{3}{8}$.

Caudalis rounded; denticulations of the præoperculum gradually becoming larger towards the angle; sub- and interoperculum entire. The height of the body is $3\frac{1}{3}$ in the total length, the length of the head $3\frac{1}{2}$. Nearly uniform brownish, lighter towards the belly.

Mediterranean; Atlantic Coast of the Peninsula. (Cape of Good Hope?)

a. Very large specimen. Sine patria.
b. Very large specimen: stuffed. Sine patria.
c. Adult: stuffed. Madeira. Presented by the Zoological Society. Type of *S. fimbriatus*, Lowe.
d. Very large specimen: stuffed. Cape of Good Hope. Presented by Sir A. Smith.
e. Young: bad state. Madeira. Presented by the Rev. R. T. Lowe.

75. **Serranus moara.**

Temm. & Schleg. Faun. Japon. pl. 4, lower figure.

D. $\frac{11}{15}$. A. $\frac{3}{8}$.

Caudalis rounded; præoperculum with coarser denticulations at the angle; the height of the body not quite one-fourth of the total length. Brownish grey, marbled with darker. (*Schleg.*)

Japanese Seas.

76. **Serranus goreensis.**

Cuv. & Val. vi. p. 511; *Jenyns, Zool. of the Beagle, Fishes*, p. 5.

D. $\frac{11}{15-16}$. A. $\frac{3}{8}$.

Allied to *S. gigas*. Caudalis truncated or slightly emarginate. Denticulations of the præoperculum stronger at the angle. The fourth dorsal spine longest, equalling just half the entire length of the spinous portion of the fin. Uniform brown; dorsal and anal fins with a violet edge; ventral fins blackish.

Coast of Goree; St. Jago; Cape Verde Islands.

77. **Serranus erythrogaster.**

Dekay, New York Fauna, Fishes, p. 21. pl. 19. f. 52; *Holbr. Ichth. S. Carol.* p. 29. pl. 5. f. 2 (dorsal bad).

D. $\frac{11}{16}$. A. $\frac{3}{9}$. Cæc. pylor. 28.

Closely allied to *S. goreensis*. Caudalis emarginate. The height of the body is $3\frac{1}{2}$ in the total length, the length of the head is one-third of the latter. Denticulations of the præoperculum stronger at the angle. The third dorsal spine longest, shorter than the half of the entire length of the spinous portion of the fin. Pectorals rounded, distant from the anal. Olive-brown above, with more or less distinct ashy spots; beneath red; the vertical fins with blue borders.

Eastern shores of the United States; Gulf of Mexico; Sea of Jamaica.

a. Adult: skin. Jamaica. From Dr. Parnell's Collection.

78. **Serranus fuscus.**

Lowe, in Trans. Cambr. Philos. Soc. 1838, p. 196; *Valenc. in Barker-Webb and Berthelot, Ichthyol.* p. 9.

D. $\frac{11}{15-16}$. A. $\frac{3}{11}$. Vert. 24.

Caudalis truncated; præoperculum with obsolete denticulations. Blackish brown, obscurely marbled with greyish.

Madeira; Canary Islands.

Valenciennes mentions seventeen rays of the dorsal fin.

79. **Serranus æneus.**

Dalouse, *Geoffr. St. Hil. Descr. d'Eg. Poiss.* pl. 21. f. 2.

Serranus æneus, *Is. Geoffr. Poiss. d'Eg.* p. 208; *Cuv. & Val.* ii. p. 283.

D. $\frac{11}{16}$. A. $\frac{3}{9}$.

Caudalis rounded. Denticulations of the angle of the præoperculum rather stronger. Brownish green, marbled with lighter; anal and ventral fins with a blue edge; on the side of the head three oblique white bands: the first from the angle of the præoperculum to the middle of the suboperculum, the second from the eye to the posterior angle of the interoperculum, the third from the maxillary across the middle of the interoperculum.

Damietta.

80. **Serranus emarginatus.**

Valenciennes, in Barker-Webb & Berthelot, Hist. Nat. Iles Canar. Ichthyol. p. 10.

D. $\frac{11}{15}$. A. $\frac{3}{11}$. L. lat. 75.

The length of the head rather more than one-fourth of the total; the diameter of the eye is one-fifth of the former. Præoperculum distinctly serrated, with a notch above the angle; intermaxillary bones with teeth in the middle of the upper jaw only. Caudalis truncated, the third dorsal spine longest. Brownish, marbled with lighter and darker. (*Val.*)

Canary Islands.

81. **Serranus nigritus.**

Holbr. Ichthyol. S. Carol. p. 173. pl. 25. f. 2 (the eye appears to be represented much too small).

D. $\frac{11}{15}$. A. $\frac{3}{10}$.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head not quite three times. The angle of the præoperculum rather prominent, and with stronger denticulations. Caudal rounded. Uniform blackish; fins without any spots. (*Holbr.*)

Coast of South Carolina.

82. Serranus acutirostris.

Cuv. & Val. ii. p. 286, ix. p. 432; *Valenc. in Barker-Webb & Berthelot, Iles Canar. Ichthyol.* p. 11. pl. 3. f. 1; *Guichen. Explor. Sc. Algér. Poiss.* p. 35.

$$D. \frac{12}{16}. \quad A. \frac{3}{11}.$$

The height of the body is $4\frac{1}{2}$ in the total length, the length of the head $3\frac{1}{2}$. Præoperculum finely serrated behind; angle projecting, with coarser denticulations. Caudalis slightly emarginate; the third anal spine longer than the second. Uniform greenish.

Coast of Brazil; Canary Islands; Sea of Messina.

83. Serranus marginalis.

Epinephelus marginalis, *Bloch*, t. 328. f. 1.
Holocentrus rosmarus, *Lacép.* iv. pp. 389, 392. t. 7. f. 2.
Serranus marginalis, *Cuv. & Val.* ii. p. 301; *Richards. Ichth. China*, p. 233; *Bleeker, Perc.* p. 34.

$$D. \frac{11}{15\text{–}16}. \quad A. \frac{3}{8}. \quad \text{L. lat. 80–90.} \quad \text{Vert. 9/15.}$$

Caudalis truncated. Length of the head $2\frac{3}{4}$ in the total; diameter of the eye $4\frac{2}{3}$ in the length of the head. Præoperculum with rather stronger denticulations on the angle, sub- and interoperculum entire. The upper maxillary bone reaching just to the level of the posterior margin of the eye. Pectorals distant from the front end of the anal, and reaching a little behind the tip of the ventrals. Brownish or yellowish; the spinous part of the dorsal fin, and sometimes the caudal fin, black-edged.

Javanese, Chinese, and Japanese Seas; Amboyna; Timor; Louisiade Archipelago.

a. Adult. Amboyna. From Mr. Frank's Collection.
b. Adult: skeleton. China.
c. Adult. China.
d. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
e. Adult. China. Presented by J. R. Reeves, Esq.
f. Adult. China. Presented by J. R. Reeves, Esq.
g. Adult. China. Presented by J. R. Reeves, Esq.
h. Half-grown. China. Presented by J. R. Reeves, Esq.
i. Adult: stuffed. Japan.
k. Adult. India.
l. Adult: bad state. India. From the Haslar Collection.
m. Young. India. From the Haslar Collection.
n–q. Adult: stuffed. Louisiade Archipelago. Voyage of the Rattlesnake.
r. Adult: skin. Sand-bank near Darnley Island.
s. Adult: skin. Copang (Timor).

Skeleton.—That part of the upper surface of the head which is formed by the supraoccipital and the posterior part of the frontal bones is slightly elevated and rounded on both sides, there being a rather deep groove between those ridges which run from the orbit to the articulations of the suprascapula; the interior of these ridges is elevated behind, becoming inconspicuous near the orbit. The upper anterior branch of the supraoccipital crest is low, and does not exceed the supraoccipital bone; there is on each side a similar additional crest, arising from the body of the paroccipital one. The space between the orbits is narrow, with a slight median groove. The maxillary bone exhibits a nearly straight superior edge, the inferior being irregularly concave and angular. The operculum with three distinct, nearly equidistant points, the upper of which is smallest, the middle longest and very prominent; the posterior edge of the præoperculum finely serrated, with rather stronger denticulations at the angle; the lower edge entire, with a longitudinal groove; the suboperculum entire, produced behind into a long soft point; the interoperculum with one or two inconspicuous denticulations. The dentition is very similar to that of *S. tæniops*; there is a pair of strong, but short canines in each jaw. I cannot decide whether another pair, not perfectly developed, between the upper canines, are merely the successors of the latter, or whether they will form a second separate pair of canines. A similar pair, also not perfectly developed, are to be seen in the lower jaw, but at the outside of the canines which are in function. The first interhæmal spine is long and strong, equal to the length of the second to the eighth (inclusive) vertebra, and attached to the hæmal spine of the tenth vertebra; it corresponds to the first and second dermohæmal, there being no separate interhæmal for the first; but this strong interhæmal generally exhibits a prominent longitudinal ridge along its anterior surface, and I consider this ridge to be the interhæmal properly belonging to the first dermohæmal, being a separate bone in an earlier period of life, but afterwards united with that of the second.

84. **Serranus horridus.**

Serranus horridus, (*Kuhl & v. Hass.*) *Cuv. & Val.* ii. p. 321; *Bleeker, Perc.* p. 36; *Cantor, Catal.* p. 9.

$$D. \frac{11}{15\text{-}16}. \quad A. \frac{3}{8}.$$

Caudalis rounded; head nearly one-third of the total length; eye nearly one-seventh of the length of the head. Sub- and interoperculum entire; præoperculum with rounded angle and a fine, but distinct serrature; the third dorsal spine to the eleventh nearly equal in height, and much shorter than the soft dorsal fin. The upper maxillary reaches beyond the posterior margin of the eye. Upper profile of the head rather concave. Brown, largely marbled with blackish brown; head, body, and fins with roundish brownish-black spots.

Javanese Sea; Sea of Pinang.

One stuffed specimen in the Collection of the East India House.

85. **Serranus crapao.**

Cuv. & Val. iii. p. 494; *Bleeker, Perc.* p. 37; *Richards. Ann. & Mag. Nat. Hist.* 1842, ix. p. 25.

D. $\frac{11}{15}$. A. $\frac{3}{9\ (8\ \textit{Bleek.})}$. L. lat. 80.

Caudalis rounded; head one-third of the total length; diameter of the eye one-seventh of the length of the head; angle of the præoperculum with stronger denticulations; sub- and interoperculum entire. Brownish; all the parts with rounded brown spots.

Sunda Sea; Port Essington.

a. Adult: skin. Port Essington.
b. Adult: skin. Port Essington. Purchased of J. Gould, Esq.

86. **Serranus sebæ.**

Bleeker, Amboina, v. p. 488.

D. $\frac{11}{16}$. A. $\frac{3}{8}$. L. lat. 85–90.

Caudalis rounded; length of the head $3\frac{1}{2}$ in the total; diameter of the eye one-fifth of the length of the head; upper profile of the head convex; angle of the præoperculum with stronger spinous teeth; suboperculum entire; interoperculum with one or two denticulations. The third spine of the dorsal and anal fins longest. Brownish; body and all the fins with round darker spots; the soft part of the dorsal fin and the caudalis with a narrow yellow edge.

Chinese Sea; Amboyna.

a. Adult. China. Presented by Sir J. Richardson.
b. Half-grown. Amboyna. From Mr. Frank's Collection.

87. **Serranus summana.**

Perca summana, *Forskal,* p. 42.
Bodianus summana, *Bl. Schn.* p. 334.
Pomacentrus summana, *Lacép.* iii. p. 511.
Serranus summana, *Cuv. & Val.* ii. p. 344; *Rüpp. N. W. Fische,* p. 102, and *Atl.* p. 104; *Lefebvre, Voy. Abyss. Zool.* p. 229. pl. 5. f. 1.
—— leucostigma, *Cuv. & Val.* ii. p. 346.

D. $\frac{11}{16}$. A. $\frac{3}{8}$.

Caudalis rounded; denticulations of the præoperculum fine and equal; interoperculum with some fine denticulations. Brown, marbled with greyish and spotted with white; a blackish streak passing below the eye; a black spot on the tail.

Red Sea.

a. Large specimen: stuffed: not good state. Red Sea. Purchased of the Frankfort Museum.

88. **Serranus micronotatus.**

Rüppell, N. W. Fische, p. 90.

D. $\frac{11}{15}$. A. $\frac{3}{9}$.

Caudalis rounded; præoperculum finely serrated; operculum with a single spine; second dorsal spine longest. Greyish; head, body, and dorsal fin punctulated with brown; a lighter streak from below the eye to the base of the pectoral fins. (*Rüpp.*)

Massana (Red Sea).

89. **Serranus tumilabris.**

Cuv. & Val. ii. p. 346.

D. $\frac{11}{15}$. A. $\frac{3}{9}$.

Caudalis rounded; præoperculum with equal and fine denticulations; sub- and interoperculum entire; lips thick, swollen. Brown, marbled with darker; all the parts with rounded greyish-white specks; a black streak behind the maxillary bone.

Seychelles.

a. Adult. Sine patria. From Mr. Brandt's Collection as *Epinephelus punctatus.*

90. **Serranus hoevenii.**

Bleeker, Perc. p. 36.

D. $\frac{11}{16}$. A. $\frac{3}{8}$. L. lat. 80.

Caudalis rounded. The length of the head is $2\frac{3}{4}$ in the total; diameter of the eye one-sixth of the length of the head, much larger than the distance between the eyes, but equal to the distance of the eye from the end of the snout; maxillary bone just reaching the vertical from the posterior margin of the orbit; præoperculum with rather larger denticulations at the angle; sub- and interoperculum entire. Brownish, with round pearl-coloured spots on the sides of the body; fins immaculate, with a black and yellow edge.

Batavia.

a. Adult. Amboyna. From Mr. Frank's Collection.

91. **Serranus bontoo.**

Russell, pl. 128.

Serranus bontoo, *Cuv. Règne Anim.*; *Cuv. & Val.* ii. p. 334, vi. p. 523; *Cantor, Catal.* p. 11.

D. $\frac{11}{16}$. A. $\frac{3}{8}$.

Caudalis rounded; præoperculum with strong denticulations, strongest at the angle, and with a very oblique lower limb. Brown, with large, scattered ferruginous spots; dorsal and anal fins whitish, with a black and white edge; caudalis greyish at the end, with a bluish spot between each two rays; pectoral fins blackish, with a broad whitish band at the base.

Madras; Vizagapatan; Java.

a. Adult: stuffed. Ceylon.

92. Serranus celebicus

Bleeker, Celebes, i. p. 217.

D. $\frac{11}{15\text{–}16}$. A. $\frac{3}{8}$. L. lat. 90.

Candalis truncated. The height of the body is $3\frac{2}{3}$ in the total length, the length of the head $3\frac{1}{2}$; the diameter of the eye is $4\frac{1}{2}$ in the length of the head; upper maxillary bone reaching to beneath the centre of the eye; præoperculum strongly serrated, with three or four still stronger denticulations at the angle; sub- and interoperculum denticulated; the fourth dorsal spine longest. Reddish brown, with large, roundish darker spots; all the fins brown-spotted; dorsal and caudal fins yellow-edged.

Celebes.

a. Half-grown. Amboyna. From Mr. Frank's Collection.

93. Serranus variolosus.

Renard, Poiss. t. 28. f. 153, and t. 3. f. 17; *Valentyn, Ind.* iii. f. 41.
Perca variolosa, *Forst. MSS.*
Serranus variolosus, *Cuv. & Val.* ii. p. 354; *Bleeker, Perc.* p. 35.

D. $\frac{11}{16}$. A. $\frac{3}{8}$. L. lat. 110.

Caudalis truncated; head one-third of the total length; diameter of the eye one-fourth of the length of the head; upper maxillary bone reaching to below the posterior half of the eye; præoperculum with rather stronger denticulations at the angle; sub- and interoperculum entire. Brownish, with roundish brown spots on the head, body, and soft part of dorsal fin; the other fins immaculate.

Sunda Sea; Pacific.

a. Adult. Pacific.
b. Adult. Pacific.
c, *d.* Half-grown. Pacific. From the Haslar Collection.

94. Serranus hoedtii.

Bleeker, Amboina, vi. p. 406.

D. $\frac{11}{14\text{–}16}$. A. $\frac{4\,7}{8}$. L. lat. 120.

Caudalis truncated, with slightly rounded angles. The diameter of the eye is $4\frac{3}{5}$–$4\frac{4}{5}$ in the length of the head; the upper maxillary bone reaching to the level of the posterior margin of the eye; præoperculum serrated, with four to six rather stronger denticulations at the angle; suboperculum entire; interoperculum scarcely denticulated. The third or the third and fourth dorsal spines longest; the second and third anal spines nearly equal in length. Bluish; head, body, and all the fins dotted with black; the soft parts of the dorsal and anal fins yellow-edged; caudal and pectoral fins orange-coloured, with a violet base. (*Bl.*)

Sea of Amboyna.

95. Serranus akaara.

Faun. Japon. p. 9. pl. 3. f. 1; *Richardson, Ichthyol. China,* p. 231.

D. $\frac{11}{15-16}$. A. $\frac{3}{8}$.

Caudalis rounded. Præoperculum serrated, denticulations at the angle sometimes very strong, sometimes equal to the others. The third, fourth and fifth dorsal spines longest, the posterior ones not much shorter; the second and third anal spines nearly equal in length (according to the *Fauna Japonica,* the second longest); pectorals not reaching the anus. Maxillary bone not reaching behind the level of the eye. Brownish red; head, body, and vertical fins covered with round bright red spots.

Japanese Seas.

a. Adult: stuffed. Japan.
b. Adult: stuffed. India.

96. Serranus apua.

Margr. p. 158; *Lib. Princ.* i. p. 315.
Bodianus apua, *Bloch,* t. 229; *Lacép.* iv. p. 296.
? Serranus apua, *Cuv. & Val.* ii. p. 287; *Guichen. in Ramon de la Sagra, Hist. Cub.* p. 11.

D. $\frac{11}{16}$. A. $\frac{3}{8}$. L. lat. 105.

Caudalis truncated, with rounded angles; angle of the præoperculum with stronger denticulations. Brownish, with brown spots on the sides of the head and body; about twenty-five between the opercle and the root of the caudal. The spinous dorsal higher than the soft; the vertical fins with a broad black edge.

Caribbean Sea.

a. Adult: stuffed. West Indies. From Mr. Scrivener's Collection.
b, c. Half-grown: stuffed. West Indies. From Mr. Scrivener's Collection.
d–f. Adult: skins. Jamaica. From Dr. Parnell's Collection.

97. Serranus mentzelii.

Cuv. & Val. ii. p. 291.

D. $\frac{11}{16}$. A. $\frac{3}{8}$.

Caudalis truncated; muzzle short, blunt. Brownish, marbled with reddish brown, and with streaks of the same colour on the belly, anastomosing on the tail. Fins uniform; dorsalis and analis black-edged. (*Val.*)

Coast of Brazil.

ε. With fifteen to seventeen rays.

98. Serranus hexagonatus.

D. $\frac{11}{15-17}$. A. $\frac{3}{8}$. L. lat. 80.

Caudalis rounded. The length of the head is $3\frac{1}{3}$–$3\frac{1}{2}$ in the total:

diameter of the eye nearly one-fifth of the length of the head, and larger than the distance between the eyes. The upper maxillary bone reaches beyond the level of the posterior margin of eye. The angle of the præoperculum with stronger spinous teeth; sub- and interoperculum entire; the pectoral reaches as far as the ventral—that is, not to the vent. Brownish, covered all over with large rounded or hexagonal spots.

From the Red Sea along the African coast through all the Indian Seas into the North of Australia and into the Pacific.

Var. A. HEXAGONATA. The spots hexagonal, separated from one another by white lines on the head, on the anterior part of the body, and on the pectoral and caudal fins, but more irregular on the other parts; sometimes closer together at the base of the dorsal, and there forming three darker blotches.

Perca hexagonata, *Forster, Descr. Anim. ed. Licht.* p. 189.
Holocentrus hexagonatus, *Bl. Schn.* p. 323.
Serranus hexagonatus, *Cuv. & Val.* ii. p. 330, vi. p. 516; *Guérin, Icon. Poiss.* pl. 4. f. 1; *Richardson, Voy. Sulph.* p. 82. pl. 38. f. 1; *Cantor, Catal.* p. 7; *Bleek. Natuurk. Tydschr. Nederl. Indie,* vi. p. 191; *Gay, Chile, Zool.* ii. p. 150.
—— foveatus, *Cuv. & Val.* ii. p. 329.
—— stellans, *Richardson. Ann. Nat. Hist.* 1842, vol. ix. p. 23.

a. Half-grown. Madagascar. Presented by Dr. J. E. Gray.
b. Adult. China. Presented by Sir J. Richardson.
c. Adult. Philippines.
d, *e*. Adult and half-grown. Amboyna. Purchased of Mr. Frank.
f. Half-grown. Amboyna. Purchased of Mr. Frank.
g, *h*. Young. Amboyna. Purchased of Mr. Frank.
i. Half-grown: stuffed. Louisiade Archipelago. Voyage of the Rattlesnake.
k. Half-grown: bad skin. Sand-bank near Darnley Island.
l. Adult. India. From Dr. Russell's Collection as *Pomacentrus punctatus*.
m. Adult. India. Purchased of Mr. Frank.
n–p. Half-grown. Feejee Islands. Presented by the Lords of the Admiralty.

Var. B. MERRA. The spots roundish, without white lines between, sometimes confluent in the middle of the sides, much smaller on the fins.

Seba, iii. 27. 7; *Klein, Hist. Pisc.* v. p. 43. t. 8. f. 3.
Perca tauvina, *Forsk.* p. 39.
Epinephelus merra, *Bl.* t. 329; *Bl. Schn.* p. 300.
Holocentrus tauvinus, *Bl. Schn.* p. 321; *Lacép.* iv. p. 338.
—— merra, *Lacép.* iv. p. 342.
Serranus merra, *Cuv. & Val.* ii. p. 325.

q. Half-grown. Singapore.
r, *s*. Half-grown. China. Presented by Sir J. Richardson.
t. Half-grown. Philippines.

u, v. Adult. India. From the Haslar Collection.
w. Adult. India. Purchased of Mr. Brandt.
x, y. Half-grown. India. From the Haslar Collection.
z. Half-grown. Purchased of M. Parzudaki.

ζ. With sixteen or seventeen rays.

99. **Serranus morio.**

Cuv. & Val. ii. p. 285; *Guichen. in Ramon de la Sagra, Hist. Cuba, Poiss.* p. 11.

D. $\frac{11}{17}$. A. $\frac{3}{9}$.

Allied to *S. gigas*, but with stronger denticulations of the præoperculum; caudalis slightly emarginate. In life grey, marbled with brownish; snout, lower jaw, and branchiostegal membrane red; anal fin and pectorals orange-coloured, the former with a brown edge; ventral fins with large red spots.

Atlantic coasts of Temperate America; St. Domingo; Cuba.

100. **Serranus impetiginosus.**

Müll. & Trosch. in Schomburgk's Hist. Barb. p. 665.

D. $\frac{11}{17}$. A. $\frac{3}{8}$.

Caudalis rounded. Præoperculum rounded throughout, with the posterior limb obliquely descending backwards, and with some obsolete and coarser denticulations at the angle; the distance between the eyes very narrow. Brownish, covered all over with round dark-coloured spots, each spot occupying about four scales; they are less numerous on the fins than on the snout; a larger oblong black spot at the base of the last three spines and of the first ray of the dorsal fin; another spot, of similar size and colour, behind the dorsal fin on the back of the tail.

Caribbean Sea.

a. Adult: skin: not good state. Trinidad. Presented by J. B. Richardson, Esq.

101. **Serranus ongus.**

Holocentrus ongus, *Bloch*, pl. 234; *Bl. Schn.* p. 314; *Lacép.* iv. p. 380.
Serranus dichropterus, *Cuv. & Val.* ii. p. 293.

D. $\frac{11}{16}$. A. $\frac{3}{8}$.

Caudalis rounded; præoperculum with stronger denticulations on the angle. Uniform dark brown, the fins with a darker edge; a black streak behind the maxillary bone.

Coasts of Central and South America.

a, b. Adult: not good state. Bahia. From M. Parzudaki's Collection.

c. Half-grown. Bahia. From M. Parzudaki's Collection.
d. Adult: very bad state. America. From the Haslar Collection.

I am not enabled, from the short description given by Professor Peters (in *Wiegm. Arch.* 1855, p. 236), of *Serranus melas* from Mozambique, to distinguish it from the above species.

102. **Serranus undulosus.**

Serranus undulosus, *Cuv. & Val.* ii. p. 295.
? Bodianus undulosus, *Quoy & Gaim. Voy. Freyc. Poiss.* p. 310 (said to be caught in the Sea of Waigiou).

$$\text{D. } \frac{11}{16\text{–}17}. \quad \text{A. } \frac{3}{11\text{–}12}. \quad \text{Vert. } 10/14.$$

Caudalis truncated. Præoperculum very finely serrated, with rather stronger denticulations at the angle; sub- and interoperculum entire; pectorals far distant from the anal, and reaching a little beyond the tip of the ventrals; the upper maxillary bone reaching to or a little behind the eye. Brownish grey, with some rather oblique darker bands along the sides of the head, and with irregular, large, oblong blackish spots on the body; fins with narrow blackish edges; pectorals yellow.

This species exhibits the upper jaw covered with minute scales as well as the lower.

Caribbean Sea; Coast of Brazil.

a. Large specimen. Cuba. Presented by the Zoological Society.
b. Adult: skeleton. Cuba. Presented by the Zoological Society.
c, d. Half-grown. Cuba. Presented by the Zoological Society.
e–g. Adult: skins. Jamaica. From Dr. Parnell's Collection.
h. Half-grown: skin in spirits. Trinidad. Presented by J. B. Richardson, Esq.
i, k. Adult: stuffed. West Indies. From Mr. Scrivener's Collection.
l, m. Half-grown. Puerto Cabello. From Mr. Brandt's Collection.
n. Half-grown. Brazil. Presented by Lord Stuart.
o. Adult. America. From the Haslar Collection.

Skeleton.—The upper surface of the skull is concave throughout; there is no ridge nor any other prominence between the elevated orbital edges of the frontals; from these edges a sharp crest on each side runs backwards to the articulation of the suprascapula; the occipital crest emits a median branch in front, which does not extend to the frontal. The maxillary bone is styliform in more than its anterior half, suddenly widening behind, the superior and inferior margins being rather irregularly curved. The præoperculum is rounded throughout, finely serrated behind, and exhibits four or six coarser denticulations at the angle; operculum with three conspicuous spines, the upper of which is the most distant, and not projecting beyond the margin; the middle one is acute, longest and strongest; the lower rounded, short, but prominent. There are two strong canines in the upper jaw, causing an impression in the lower jaw, and receiving two smaller canines of the mandibula between;

the posterior front teeth of the upper jaw are rather small—much smaller than in *S. coronatus*: in the remainder of the dentition both species agree with each other. The spines of the anal fin being small, the interhæmal is also much less developed; it is fixed to the eleventh hæmal, and is only as long as the first six vertebræ together.

103. **Serranus tsirimenara.**

Temm. & Schleg. Faun. Japon. Poiss. p. 7. pl. 4 A. f. 3; *Bleek. Verh. Batav. Genootsch.* xxvi. p. 62.

D. $\frac{11}{16\text{–}17}$. A. $\frac{3}{7\text{–}9}$. L. lat. 90–100.

The height of the body is four times in the total length; the length of the head $3\frac{1}{4}$–$3\frac{1}{3}$; the diameter of the eye is $4\frac{2}{5}$–$4\frac{3}{4}$ in the latter. The upper maxillary bone reaches rather beyond the posterior margin of the orbit. Præoperculum with rather stronger denticulations at the angle; interoperculum scarcely, suboperculum not serrated. The fifth dorsal spine longest, shorter than one-half of the depth of the body. Caudal fin rounded. Red, with seven or nine rose-coloured blotches, one series of which is above the lateral line, and the other beneath; the dorsal fin with a black upper edge (dorsali spinosa superne parte membranæ emarginata macula trigona nigra. *Bl.*).

Japanese Sea.

104. **Serranus punctatissimus.** (Plate X. fig. A.)

D. $\frac{11}{17}$. A. $\frac{3}{8}$. L. lat. 100.

Caudalis truncated. The height of the body is $3\frac{1}{3}$ in the total length, the length of the head $3\frac{1}{2}$; the diameter of the eye is $4\frac{1}{2}$ in the latter. The upper maxillary bone reaches to the level of the posterior margin of the eye. Præoperculum serrated behind, with about three spinous teeth at the angle; sub- and interoperculum entire. The fourth dorsal spine and the third of the anal fin longest; the ventrals rather longer than the pectorals, not reaching to the vent. Brownish olive (in spirits); head, body, and the soft parts of the dorsal and anal fins punctulated with brown. The soft portions of the vertical fins and the ventrals with a broad black margin.

a. China. Presented by Mr. Reeves.

Description.—In habit similar to *S. marginalis*. The height of the body is $3\frac{1}{3}$ in the total length, the length of the head $3\frac{1}{2}$. The scales extend on the upper surface beyond the nostrils, but the præorbital and the upper maxillary are naked. The space between the eyes is rather flat, and less than the diameter of the eye; the extent of the snout is equal to the latter, and $4\frac{1}{2}$ in the length of the head. The nostrils are lateral; the posterior opening larger, oval. The cleft of the mouth is wide, the upper maxillary reaching to the level of the posterior margin of the eye. The posterior limb of the præoperculum descends obliquely backwards, is finely serrated, and has a slight emargination above the angle, and about three stronger spinous teeth at the angle. Sub- and interoperculum entire. The spines of the operculum are rather indistinct, especially the upper and lower; the former is more distant from the middle one.

The spinous portion of the *dorsalis* is longer and not much lower than the soft. All the spines are of moderate length and strength: the first is not quite half as long as the second, the fourth longest; the posterior ones gradually become shorter, the last being about five-sixths of the fourth. The membrane between the spines is moderately notched, without emitting appendages. The soft portion has a slightly rounded upper margin, the tenth ray being about one-tenth longer than the longest spine. All the fin is nearly free, like the others, and not protected by an encroachment of the integument. *Caudalis* truncated. The soft part of the *analis* is rather higher than the dorsal, and rounded; the second spine is not much stronger, and rather shorter, than the third. The *pectoralis* is rounded, and composed of eighteen rays; it is a little shorter than the ventral. The *ventralis* is supported by a spine of more than half the length of the fin, and does not reach the vent; its root falls vertically beneath that of the pectoral.

The canine teeth are small, and there is a small, conspicuous canine tooth on each side of the vomer. The scales are very small.

The ground-colour is now brownish olive, lighter on the belly; the head and body are covered with brown specks, of the size of a scale, and extending on the base of the soft portions of the dorsal and anal fins; these and the caudal fin have a broad black margin. The ventrals are nearly entirely brownish black, the colour becoming deeper on the hinder margin. The pectorals are not coloured.

Length of the specimen 6″

105. Serranus rupestris.

Cuv. & Val. ix. p. 437.

D. $\frac{11}{16}$. A. $\frac{3}{10}$. Cæc. pylor. 17.

Caudalis truncated. Præoperculum finely serrated, slightly emarginate above the angle. Dirty yellowish, with large, rounded, unequal spots of red colour on the back, on the base of the dorsal fin, and on the ventrals, and of violet colour on the sides and on the head; pectoral fins with a broad yellow margin; the vertical fins with a narrow black and white edge. (*Val.*)

St. Domingo.

106. Serranus flavo-cæruleus.

Holocentrus flavo-cæruleus, *Lacép.* iv. p. 366.
—— gymnosus, *Lacép.* iii. pl. 27. f. 2, iv. p. 372.
Bodianus macrocephalus, *Lacép.* iii. pl. 20. f. 2, iv. pp. 293, 295.
Serranus borbonicus, *Quoy & Gaim. Voy. Freyc. Poiss.* pl. 57. f. 2.
—— flavo-cæruleus, *Cuv. & Val.* ii. p. 297; *Bennett, Fishes of Ceylon,* pl. 19; *Peters, Wiegm. Arch.* 1855, p. 236.

D. $\frac{11}{16-17}$. A. $\frac{3}{8\,(10)}$.

Caudalis slightly emarginate. Præoperculum with stronger denticulations on the angle. Blackish brown; tail and all the fins yellow.

Coast of Mozambique; Isle de France; Ceylon.

a. Large specimen: stuffed. Isle de France.
b. Adult: stuffed. Isle de France.
c. Adult. Mauritius. Presented by the Zoological Society.
d. Bad skin. Ceylon. Presented by Dr. Kelaart.
e. Large specimen: not good state: has been in chloride of zinc. Sine patria. From the Haslar Collection.—Tail and root of the caudal fin black; anal fin with ten soft rays.

107. **Serranus spiniger.** (PLATE X. fig. B.)

D. $\frac{11}{16}$. A. $\frac{3}{8}$. L. lat. 90.

Caudalis truncated. The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $3\frac{1}{3}$. Præoperculum rounded, with coarser denticulations at the angle. The second dorsal spine nearly twice as long as any of the others.

a. Adult. Sine patria. Old Collection.

Description.—The form of the body is compressed, oblong, its greatest height comprised $3\frac{1}{2}$ in the total length; the length of the head is $3\frac{1}{3}$ in the same; the upper surface of the head is rounded, convex, entirely covered with minute scales, which extend on the præorbital, cheeks, all the opercles, the lower jaw, and on a part of the maxillary. The diameter of the eye is $5\frac{1}{2}$ in the length of the head, larger than the distance between the eyes, and two-thirds of the extent of the snout. The two openings of the nostril are small, round, equal, and near together. The cleft of the mouth is wide, the upper maxillary bone reaching nearly to the posterior margin of the orbit. The lower jaw is very prominent; the lips thick and fleshy. The præoperculum is rounded throughout, finely serrated behind, and with several coarse denticulations at the angle; the sub- and inter-operculum exhibit a fine serrature on a part of their inferior margin. Operculum with three conspicuous spines: the upper smallest and shortest, nearly concealed by the scales; the middle long and prominent; the lower of half the size; the upper and middle spines are rather nearer together than the lower and middle ones.

The soft portion of the *dorsalis* is much higher, but shorter than the spinous. The latter shows a peculiarity that is not found in any of the other *Serrani*: the first and shortest spine is followed by the second, which far exceeds the others, and even the rays, in length and strength; it is half as long as the body is high, and nearly twice as long as the third; all the following spines are nearly equal. The upper margin of the soft portion is rounded, the middle rays being rather longer than the others. The *caudalis* appears truncated; but by stretching it out as far as possible, the posterior margin becomes slightly convex. The front part of the base of the *analis* is protected by a thick encroachment of the scaly integument; its soft portion resembles that of the dorsal in height and form; the spines are thick, the first not half the length of the second, and both the others are nearly equal in length. The *pectoralis* is rounded, composed of from eighteen to nineteen rays, and extends as far backwards as the ventral—that is, not entirely to the vent. The spine of the *ventralis* reaches beyond the half of the length of the fin. The canines are strong, and there are no large lateral teeth.

The specimen is rather discoloured, and the body appears now to be of a uniform brownish colour. The soft part of the dorsal, the caudal, and the pectoral fins are of a yellowish-white colour. I cannot decide whether this is natural, or merely the effect of having been exposed to the light.

Length of the specimen 10″.

108. **Serranus ura.**

? Serranus ura, *Cuv. & Val.* ii. p. 332.
? —— ara, *Faun. Japon.* p. 9.
? —— ura, *Richardson, Ann. & Mag. Nat. Hist.* 1842, ix. p. 24.

$$D.\ \frac{11}{17}.\quad A.\ \frac{3}{8}.$$

Caudalis rounded; pectoralis far distant from the anal fin. The length of the head is $3\frac{1}{2}$ in the total, the diameter of the eye about one-fifth of the length of the head. Præoperculum equally and very finely serrated; the third and fourth dorsal spines longest, one-third of the length of the head; the third spine of the anal fin longer and more slender than the second. Dried specimen greyish brown; brown-spotted all over, the spots of moderate size, each covering about four scales.

a. Large specimen: stuffed. St. Helena. From General Hardwicke's Collection.

Valenciennes' description contains so few precise characters, that it is impossible, without direct comparison of the specimens, to decide whether that in the British Museum Collection really belongs to the above species; it agrees with his description of *ura*, but so also do many other species. Moreover, Valenciennes' specimen is said to be from *Japan*, whilst the other is from the Atlantic; but there may be a mistake in one or the other. Therefore I refer our fish for the present to *S. ura*, not being inclined to found a new species upon a single stuffed specimen.

109. **Serranus melanurus.**

Bodianus melanurus, *Geoffr. Descr. Eg.* pl. 21. f. 1; *Is. Geoffr. Poiss. d'Eg.* p. 205.

$$D.\ \frac{11}{17}.\quad A.\ \frac{3}{9}.$$

Caudalis truncated. Præoperculum with three or four strong spinous teeth at the angle; sub- and interoperculum rather strongly denticulated. Coloration uniform; the soft part of the dorsalis, the caudal and anal fins with ferruginous spots.

Suez.

110. **Serranus gilberti.**

Percis no. 15, *Klein, Hist. Pisc.* v. p. 43. t. 8. f. 3.
Serranus gilberti, *Richardson, Ann. Nat. Hist.* 1842, p. 19, and *Ichth. China*, p. 230.
—— megachir, *Richardson, Ichth. China*, p. 230.
—— pardalis, *Bleeker, Perc.* p. 37.

D. $\frac{11}{16-17}$. A. $\frac{3}{8-9}$. L. lat. 75–80.

Caudalis rounded. The length of the head is $3\frac{1}{2}$ in the total; the diameter of the eye $4\frac{2}{3}$ in the length of the head, larger than the distance between the eyes, but equal to the distance of the eye from the end of the snout. Pectoralis very large, nearly equal to the length of the head, and just reaching to the front end of the anal fin; the maxillary bone reaches beyond the hinder level of the eye. Præoperculum finely serrated, with stronger denticulations at the angle; sub- and interoperculum entire. Brownish, all parts with large, rounded, dark-brown spots; behind the maxillary bone a black streak.

China Seas; Batavia; Sumbawa; Amboyna; Torres Straits; North Australia.

a, b. Adult: skins. China. From Mr. Warwick's Collection.
c. Adult. China.
d. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
e. Adult. Amboyna. From Mr. Frank's Collection.
f. Young. Amboyna. From Mr. Frank's Collection.
g. Adult stuffed. Australia.
h. Adult: skin. Port Essington.

Fishes which have been skinned often become stretched, and more elongate than they are in nature; on the other hand, the fins shrink together and become shorter, especially the soft ones; thus the distance between the end of the pectoral fins and the analis appears to be greater. This was the case with specimens named by Dr. Richardson *S. gilberti*, which name has the priority. In specimens which decidedly belong to Dr. Richardson's *S. megachir*, I do not find the number of the soft dorsal rays to be fifteen, but always sixteen, or even seventeen.

111. **Serranus nebulosus.**

Cuv. & Val. ii. p. 313; *Bleeker, Perc.* p. 34 (not *Richardson*).

D. $\frac{11}{17}$. A. $\frac{3}{8}$. L. lat. 75.

Caudal fin rounded. Suboperculum entire, interoperculum slightly denticulated; angle of the præoperculum with rather strong teeth, rectangular. Length of the head more than one-third of the total; eye of moderate size, its diameter one-fifth of the length of the head. Brownish, darker marbled; fins without spots or streaks.

Javanese Sea.

112. Serranus bontoides.

Bleeker, Amboina, vi. p. 405.

$D. \frac{11}{16-17}. \quad A. \frac{3}{8}. \quad$ L. lat. 80.

Caudalis rounded. The diameter of the eye one-fourth of the length of the head; the upper maxillary bone reaching to below the posterior half of the eye. Præoperculum serrated, with rather stronger denticulations at the angle; sub- and interoperculum entire; the hinder nine dorsal spines nearly equal in length; the second anal spine longest. Brownish, with scattered darker spots on the head and body; the dorsal fin only with a few brown spots; the soft part of the dorsalis, the caudal and pectoral fins with a yellow margin. (*Bl.*)

Sea of Amboyna.

113. Serranus macrospilos.

Bleeker, Batjan, iii. p. 499.

$D. \frac{11}{16-17}. \quad A. \frac{3}{8}. \quad$ L. lat. 85.

Caudalis rounded. The diameter of the eye about one-fourth of the length of the head; the upper maxillary bone reaching beyond the posterior margin of the eye. Præoperculum serrated, with stronger denticulations at the angle; sub- and interoperculum entire; the fourth and fifth dorsal spines not much longer than the following ones; the second anal spine longest, half the height of the body. Brownish green, with large blackish spots, distant from one another, seven between the operculum and caudal fin; dorsal fin with two rather irregular series of large brown spots, about seven in the basal series; pectoral and ventral fins black, the former yellow-edged; anal fin with a black spot and yellow-edged; caudal fin orange-coloured, on the anterior half with three large round black spots, on the posterior half blackish with a yellow margin. (*Bl.*)

Sea of Batjan.

114. Serranus areolatus.

Perca areolata, *Forsk.* p. 42.
—— tauvina (not *Forsk.*), *Geoffr. Descr. de l'Eg.* pl. 20. f. 1.
Serranus tauvinus, *Geoffr. Poiss. d'Eg.* p. 201.
—— areolatus (japonicus), *Fauna Japon.* p. 8; *Cuv. & Val.* ii. p. 350; *Richardson, Ichth. China,* p. 232; *Peters, Wiegm. Arch.* 1855, p. 235.

$D. \frac{11}{17}. \quad A. \frac{3}{8}.$

Caudalis truncated. Length of the head $3\frac{2}{3}$ in the total. Præoperculum very finely serrated, with strong denticulations at the angle; pectoralis very distant from the anal fin. Dried specimens greyish brown, covered all over with numerous small brown spots.

Red Sea; Coast of Mozambique; Sea of Japan.

a. Adult: stuffed. Red Sea. Presented by J. Burton, Esq.
b. Half-grown: stuffed. Red Sea.

115. Serranus awoara.

Temm. & Schleg. Faun. Japon. p. 9. pl. 3. f. 2; *Richardson, Ichthyol. China*, p. 231.

$$D. \frac{11}{16\text{–}18}. \quad A. \frac{3}{8}.$$

Caudalis rounded. Præoperculum with the angle rather produced, more strongly denticulated than the upper part of the margin. The third, fourth, fifth and sixth spines longest, the second not much shorter. Brownish olive; head and body covered with small round yellow spots; fins with a broad yellow edge.

Japanese and Chinese Seas.

a. Adult: stuffed: not good state. China. Presented by J. R. Reeves, Esq.

116. Serranus geographicus.

Serranus geographicus, (*Kuhl & von Hass.*) *Cuv. & Val.* ii. p. 322.

$$D. \frac{11}{17}. \quad A. \frac{3}{10}.$$

Caudalis rounded. Brown, darker marbled. Dorsal fin olive; the spinous part with a large triangular spot at the base of each spine, above with a brown edge; the soft part with two longitudinal brown streaks beneath, and with large brown spots above; analis orange-coloured, with irregular brown streaks; the other fins brown-spotted. (*Val.*)

Java.

117. Serranus reticularis.

Serranus reticularis, (*Kuhl & von Hass.*) *Cuv. & Val.* ii. p. 323.

$$D. \frac{11}{17}. \quad A. \frac{3}{9}.$$

Caudalis rounded. Brownish, with small blackish-brown half-moon-like spots; head immaculate; fins with numerous blue points. (*Val.*)

Java.

118. Serranus gaimardi.

Serranus gaimardi, *Bleeker, Batavia*, p. 455; (? *Cuv. & Val.* vi. p. 520; *Quoy & Gaim. Voy. Astrol. Poiss.* p. 656. pl. 3. f. 3.)

$$D. \frac{11}{17}. \quad A. \frac{3}{8}. \quad L. lat. 90.$$

Caudalis with rather convex posterior margin. The length of the head $3\frac{3}{4}$ in the total, the diameter of the eye one-fifth of the length of the head; muzzle covered with scales; the upper maxillary bone reaching beyond the posterior margin of the eye. Præoperculum serrated, with stronger denticulations at the angle; sub- and inter-operculum entire; scales ciliated. The third dorsal spine and the second anal longest. Brownish, with scattered brown spots, round on the head, and oblong on the posterior part of the body; caudal fin black-spotted behind and with a yellow edge; dorsal and anal fins near the tips of the rays with from six to ten round black spots, the former having a yellow edge, the latter a black one; ventral and pectoral fins with scattered blackish spots. (*Bl.*)

Sea of Batavia. (New Guinea.)

119. Serranus chlorostigma.

Cuv. & Val. ii. p. 352.

D. $\frac{11}{17}$. A. $\frac{3}{9}$.

Caudalis truncated. Præoperculum finely serrated, with five or six rather stronger teeth at the angle; sub- and interoperculum with some denticulations. Whitish, entirely covered with small olive spots; spinous part of the dorsal fin edged with black, caudalis with white.

Seychelles.

120. Serranus cylindricus. (Plate XI. fig. A.)

B. 7. D. $\frac{11}{17}$. A. $\frac{3}{8}$. L. lat. 100.

Body elongate, rounded, rather cylindrical; the height $4\frac{1}{3}$ in the total length, the length of the head $3\frac{2}{3}$; the breadth equal to three-quarters of the height. Caudalis rounded. Præoperculum rounded, with fine denticulations behind; the upper maxillary bone reaching beyond the posterior margin of the eye. Covered with more or less regular hexagonal brown spots, separated from each other by white lines.

a. Adult. Madagascar. Presented by Dr. J. E. Gray.

Description.—The form of the body is more elongate and cylindrical than in any other species of *Serranus*, and might be compared with that of a *Blennius*. The height is contained $4\frac{1}{3}$ in the total length, and is only one-fourth more than the breadth. The head has a conical form, its length being contained $3\frac{2}{3}$ in the total. Between the vertex and the neck is a slight concavity, as between the eyes, the distance of which is about $\frac{3}{4}$ths of the diameter of the eye; the latter is $4\frac{1}{2}$ in the length of the head, and nearly equal to the distance between the eye and the end of the snout; the nostrils are near together. The upper maxillary bone reaches a little behind the posterior margin of the eye. All the head is covered with minute scales, except the thick and fleshy lips. Lower jaw longest. The præoperculum is rounded throughout, finely serrated behind, and with some rather stronger denticulations at the angle; its lower limb, the sub- and interoperculum are entire; operculum with three spines, the two lower of which are prominent between the scales, the upper (smallest) being hidden by them; it terminates in a very long triangular membranaceous flap.

The margins of the spinous and soft portions of the *dorsalis* are slightly convex, both being nearly equal in height; the former has a not much longer base than the soft; the first spine is only one-half the length of the second, the second three-quarters of the third; the fourth, fifth and sixth are longest; the following diminish inconspicuously in length. All are strong, with a deeply notched membrane between, and each with a membranaceous appendage behind at the tip. The first ray is one-fourth longer than the last spine; the rays become gradually longer towards the middle of the fin, and again shorter towards behind. The *caudalis* has a moderately rounded posterior margin. The *analis* commences a little behind the commencement of the soft dorsal; the third spine is rather longer, but not quite so strong as the second; the inferior margin is slightly convex, the last two rays being shorter; the distance of the anus from the anal fin is nearly equal to the length of the second anal spine. The *pectoralis* is rounded, composed of 18 rays, and reaches as far as the ventral—that is, not even to the anus. The *ventralis* has also a convex margin, the second ray being longest; the spine is rather slender, and extends beyond the half of the fin.

The canine teeth are not very developed, but those of the villiform band are relatively strong, as well as those of the vomer and palatine bones.

The whole fish, except the fins and belly, is covered with more or less regular, large hexagonal spots of brown colour, separated from each other by straight white lines; five or six of these spots along the base of the dorsal and the back of the tail are larger and of a deeper colour. All the fins exhibit rounded, scattered, large brown spots, and a narrow yellowish-white edge: even the membranaceous appendages of the spines are of the latter colour. There are a few brown spots only on the belly; the ventrals have a darker hue; there are indistinct spots on the gill-membrane.

Length of the specimen 8 inches.

121. Serranus labriformis.

Jenyns, Zool. of the Beagle, Fishes, p. 8. pl. 3.

$$D. \frac{11}{17}. \quad A. \frac{3}{8}.$$

External appearance labroid; scales beneath the lateral line ciliated, above and on the belly smooth. Caudalis with a rather convex posterior margin. Length of the head one-third of the total; diameter of the eye not quite one-sixth of the length of the head, about equalling the distance between them. Præoperculum with obsolete denticulations; the fourth dorsal spine a little the longest. Brown, variegated with greyish, black, and white; the vertical fins with a reddish edge. (*Jen.*)

Chatham Island (Galapagos Archipelago).

η. With eighteen or nineteen rays.

122. Serranus altivelis.

Cuv. & Val. ii. p. 324. pl. 25; *Richards. Ichth. China,* p. 230; *Bleeker, Perc.* p. 33; *Cantor, Catal.* p. 10.

$$D. \frac{11}{18\text{–}19}. \quad A. \frac{3}{9\text{–}10}.$$

Caudalis rounded, dorsal and anal fins much elevated; upper profile of the head concave. Præoperculum finely and equally serrated. Yellowish, all parts with distant round black spots edged with white.

Javanese and Chinese Seas; Sea of Pinang; Port Essington.

a. Large specimen. East Indies.
b. Adult. China. Presented by General Hardwicke.
c. Young: very bad state. Port Essington. From the Haslar Collection.

123. Serranus inermis.

Cuv. & Val. ix. p. 436; *Poey, Memorias Cuba,* 1851, p. 54. lam. 4. f. 2.

D. $\frac{11}{19}$. A. $\frac{3}{10}$. L. lat. 90. Cæc. pylor. 20. Vert. 10/14.

Body elevated. Caudalis truncated, with rounded angles. Præoperculum with excessively fine serrature, denticulations of the angle rather stronger; pectoral fins as long as the head, one-fourth of the total length. Brown, with large white blotches; the vertical fins spotted with white, the pectoral and ventral fins with olive.

Caribbean Sea.

a. Adult. Cuba. Presented by the Zoological Society.
b. Adult. West Indies. Presented by the Zoological Society.

124. Serranus quoyanus.

Cuv. & Val. vi. p. 519.

D. $\frac{11}{18}$. A. $\frac{3}{8}$.

Caudalis rounded. The diameter of the eye is 4$\frac{2}{3}$ in the length of the head; the height is one-fourth of the total length, the length of the head 3$\frac{1}{2}$ in the latter; the maxillary bone reaching to behind the centre of the eye. Præoperculum strongly serrated, with strong denticulations at the angle; sub- and interoperculum entire. The pectoral fins reaching beyond the ventrals, nearly to the anus. Brownish, all the parts with large dark brown spots; the ground-colour of the ventrals and pectorals blackish.

Molucca Sea.

a. Half-grown. Amboyna. From Mr. Frank's Collection.
b. Adult. Celebes. From Mr. Frank's Collection.

125. Serranus olfax.

Jenyns, Zool. of the Beagle, Fishes, p. 9. pl. 4.

D. $\frac{11}{18}$. A. $\frac{3}{11}$.

Caudalis truncated or very slightly emarginate. The length of the head is contained 3$\frac{1}{2}$ in the total; the diameter of the eye is one-seventh the length of the head, larger than the distance between them. Præoperculum with a slight sinuosity just above the angle, very obsoletely denticulated. The second dorsal spine longest, not quite equalling half the height. Coloration uniform, mottled with brown. (*Jen.*)

Chatham Island (Galapagos Archipelago).

θ. With nineteen or twenty rays.

126. Serranus dermopterus.

Temm. & Schleg. Faun. Japon. p. 10.

D. $\frac{11}{19\text{–}20}$. A. $\frac{3}{9}$.

A somewhat aberrant species. Caudalis rounded; dorsal and anal fins very high, the former with an entire upper edge; all enclosed for the greater part in a thick membrane covered with scales. Head small, muzzle short, scales very small. Præoperculum finely serrated, with some coarser denticulations at the angle. Operculum with three spines. Uniform brownish.

Japanese Sea.

3. Body with longitudinal bands.

127. Serranus formosus.

Russell, t. 129 (not good).
Sciæna formosa, *Shaw, Zool. Misc.* p. 23. t. 1007.
Serranus formosus, *Cuv. & Val.* ii. p. 311; *Richards. Ichth. China*, p. 233; *Bleeker, Perc.* p. 31.

D. $\frac{9}{16}$. A. $\frac{3}{8}$. L. lat. 75.

Caudalis rounded. Length of the head not quite one-third of the total; diameter of the eye 6½ in the length of the head. Præoperculum without stronger denticulations at the angle; suboperculum with some denticulations; interoperculum entire. In life yellowish red, with numerous blue lines, oblique on the head, horizontal on the sides; analis black-edged.

Coast of Coromandel; Madras; China Seas; Batavia.

a. Adult. China.
b. Adult: bad skin. India. Presented by J. E. J. Boileau, Esq.
c. ? Adult: stuffed. Isle de France.

128. Serranus latifasciatus.

Temm. & Schleg. Faun. Japon. p. 6.

D. $\frac{11}{12}$. A. $\frac{3}{8}$.

Caudalis with a rather convex posterior margin. Præoperculum with denticulations on the lower part of the hinder limb, and with three strong spinous teeth at the angle; maxillary bone reaching as far beyond the posterior level of eye as the diameter is long. The first dorsal spine half as long as the second; the others of nearly equal length. Brown (in a dried state), with two broad, lighter, black-edged longitudinal bands; dorsal and caudal fins with brown spots, the other ones immaculate. (*Schleg.*)

Japanese Seas.

129. Serranus morrhua.

Cuv. & Val. ix. p. 434.

D. $\frac{11}{13}$. A. $\frac{3}{8}$.

Caudalis rounded. Brownish, with four darker curved longitudinal bands; cheeks with four oblique streaks from the eye to the margin of the præoperculum; a large brown spot on the occiput. (*Val.*)

Isle de France.

130. Serranus biguttatus.

Cuv. & Val. vi. p. 507.

D. $\frac{11}{12}$. A. $\frac{3}{8}$.

Back brownish, belly yellowish; a brown line from the eye to the base of the tail; root of the pectoral fins brown. Back with two pearl-coloured spots, one beneath the eighth dorsal spine, the other beneath the fifth ray. (*Val.*)

Sea of Trincomalee.

131. Serranus pœcilonotus.

Temm. & Schleg. Faun. Japon. p. 6. pl. 4 A. f. 1; *Bleek. Verhand. Batav. Genootsch.* xxvi. p. 61.

D. $\frac{11}{14\text{–}15}$. A. $\frac{3}{8}$. L. lat. 85–90.

Caudalis rounded; præoperculum finely serrated, with two or three spinous teeth at the angle. Four white bands on each side: the first half-moon-like, surrounding the spinous part of the dorsal fin; the second parallel to the first, running from the shoulder to the middle of the soft part; the third lateral, united with that of the other side above the eyes; the fourth, from the eye to the pectoral fins and along the sides. Back of the tail with two white spots.

Japanese Seas.

132. Serranus lemniscatus.

Cuv. & Val. ii. p. 240.

D. $\frac{10}{15}$. A. $\frac{3}{8}$.

Body three times as long as broad. A brown band from the eye to the caudal fin, another obsolete one beneath. (*Val.*)

Ceylon.

133. Serranus urophthalmus.

Bleeker, Batav. p. 310.

D. $\frac{11}{15}$. A. $\frac{3}{8}$. L. lat. 100.

Caudalis rounded. The height of the body is $4\frac{1}{5}$ in the total length, the length of the head $3\frac{1}{6}$, the diameter of the eye $4\frac{1}{2}$–$4\frac{3}{5}$ in the length of the head; head pointed; the upper maxillary bone reaching beyond the hinder margin of the eye. Præoperculum serrated, with a stronger spinous tooth at the angle; sub- and interoperculum denticulated; the third and fourth dorsal spines and the second of the anal fin longest. Red (in life), with eight alternating blue and brownish longitudinal bands, oblique on the head; on each side of the muzzle a black spot, another at the root of the caudal fin; fins immaculate. (*Bl.*)

Sea of Batoe.

134. Serranus lineatus.

Cuv. & Val. ii. p. 312.

D. $\frac{11}{18}$. A. $\frac{3}{9}$.

Caudalis rounded. Præoperculum with two or three stronger spinous teeth on the angle. Brown, with four or five blackish (in life, blue) longitudinal bands, sometimes disappearing after death.

Pondicherry; China.

a. Adult. China. Presented by Sir J. Richardson.

135. Serranus amboinensis.

Bleeker, Amb. & Cer. p. 258.

D. $\frac{11}{17-19}$. A. $\frac{3}{8}$. L. lat. 100.

Caudalis rounded; the diameter of the eye is $4\frac{1}{2}$ in the length of the head. Præoperculum deeply serrated, with three stronger denticulations at the angle; sub- and interoperculum with a few denticulations; the third, fourth and fifth dorsal spines and the second anal spine longest. Brownish; head with numerous brown specks; body with from ten to twelve more or less serpentine deep-brown longitudinal stripes; fins brown, not spotted.

Sea of Amboyna.

a. Adult: skin. Ceylon. Presented by E. F. Kelaart, M.D.

27. PLECTROPOMA.

Plectropoma, *Cuv. Règne Anim.*; *Cuv. & Val.* ii. p. 387.

Seven branchiostegals. Teeth villiform, with canines in both jaws; teeth on the palatine bones, tongue smooth. One dorsal, formed by a series of spines and rays. Operculum with two or three acute points; præoperculum not notched behind, with spinous teeth at the lower limb, directed forwards. Scales small.

All the seas of the Tropical regions.

1. Plectropoma maculatum.

Bodianus maculatus, *Bloch*, t. 228; *Lacép.* iv. pp. 280, 293.

Plectropoma punctatum, *Quoy & Gaimard, Voy. Freycinet, Zool. Poiss.* p. 318. t. 45. f. 1.

—— maculatum, *Cuv. & Val.* ii. p. 393; *Bleeker, Perc.* p. 39, and *Java*, p. 418.

? Plectropoma (maculatum) areolatum, *Rüpp. Atl.* pp. 110, 143 (index), and *N. W. Fische*, p. 90.

D. $\frac{8-8 - 7-7}{10-11-11-12}$. A. $\frac{3-3-2}{7-8-8}$. L. lat. 110. Vert. 10/14.

Præoperculum exceedingly finely serrated behind, and with three spinous teeth below; sub- and interoperculum entire. Caudalis truncate in younger specimens, in older ones emarginate. Red:

head, body, and vertical fins with blue spots, those of the head and of the front part of body oblong, elliptical, arranged in irregular longitudinal rows, the other ones circular and smaller. In specimens from the Red Sea all the spots are circular and of equal size.

Red Sea; Seas of Batavia, Singapore, Macassar, and Halmaheira.

a. Large specimen: stuffed. Red Seas.

2. Plectropoma leopardinum.

Holocentrus leopardus, *Lacép.* iv. pp. 332, 337.
Plectropoma leopardinum, *Cuv. & Val.* ii. p. 392. pl. 36 (not good); *Faun. Japon. Poiss.* p. 12; *Bleeker, Java*, p. 420.
—— leopardus, *Richardson, Ichthyol. China*, p. 230.
—— cyanostigma, *Bleeker, Topogr. Batav. in Nat. Gen. Arch. Ned. Ind.*
—— maculati var. *b*, *Bleeker, Perc.* p. 40.

D. $\frac{8\text{-}8 \text{ — } 7\text{-}7}{10\text{-}11\text{—}11\text{-}12}$. A. $\frac{3\text{-}3\text{—}2\text{-}2}{7\text{-}8\text{—}8\text{-}9}$. L. lat. 120.

Præoperculum exceedingly finely serrated behind, and with five spinous teeth beneath, the three lowest of which are close together; suboperculum and interoperculum entire. Caudalis slightly emarginate. Brownish red: head, body, vertical fins, and base of the pectorals with numerous, very small, round blue spots, much smaller than the interspace between; caudalis with a yellow posterior edge.

Red Sea; Javanese and Japanese Seas; Australia; Louisiade Archipelago.

a. Large specimen: stuffed. Louisiade Archipelago. Voyage of the Rattlesnake.

3. Plectropoma oligacanthus.

Bleeker, Java, ii. 1854, p. 422.

D. $\frac{6\text{-}7}{12}$. A. $\frac{3}{8}$. L. lat. 120.

Præoperculum scarcely denticulated behind, and with three or four spinous teeth below; sub- and interoperculum entire. Caudalis slightly emarginate. Red with five or seven oblique blue streaks from the eye to the sub- and inter-operculum; two or four other streaks from the eye to the snout; the anterior part of body with blue streaks; the posterior and caudal fin with numerous elliptical and round blue spots; the soft part of the dorsal fin, ventrals, and analis with oblique blue streaks; pectoral fins with an orange-coloured edge. (*Bl.*)

Sea of Batavia.

4. Plectropoma melanoleucum.

Renard, i. pl. 22. f. 120; *Valentyn*, f. 497 (bad).
Bodianus melanoleucus, *Lacép.* iv. pp. 283, 297.
—— cyclostoma, *Lacép.* iii. pl. 20. f. 1, iv. pp. 282, 295.

Labrus lævis, *Lacép.* iii. pl. 23. f. 2. pp. 431, 479.
Plectropoma melanoleucum, *Cuv. & Val.* ii. p. 388; *Peters, Wiegm. Arch.* 1855, p. 238.

D. $\frac{8}{11}$. A. $\frac{2}{8}$.

Præoperculum with entire posterior margin, and with four or five spinous teeth below; caudalis truncated. Grey, with five black cross-bands.

Isle de France; Ibo (Mozambique).

5. Plectropoma nigrorubrum.

Cuv. & Val. ii. p. 402; *Quoy & Gaim. Voy. Astrol. Poiss.* p. 659. pl. 4. f. 1.

D. $\frac{10}{17-18}$. A. $\frac{3}{8}$. Cæc. pylor. 8.

Præoperculum finely serrated behind, and with two equal and strong spinous teeth below, one of which is placed at the angle. Caudalis truncated. Reddish yellow, with five black cross-bands.

King George's Sound.

a. Adult: stuffed. Sine patria.
b. Half-grown: stuffed. Sine patria.

6. Plectropoma annulatum. (Plate XI. fig. B.)

D. $\frac{10}{18}$. A. $\frac{3}{7}$. L. lat. 50. L. transv. 7/20.

Præoperculum finely serrated behind, and with three spinous teeth below, one of which is placed at the angle. Caudalis rounded. Red (?), with six black cross-bands, occupying the whole depth of the body and tail; sides of the head and nape with three black bands, obliquely descending forwards.

Hab. —— ?

a. Adult. From the Haslar Collection.

Description of the specimen.—The form of the body is rather elevated, its greatest depth being somewhat more than one-third of the total length; the length of the head (opercular spine included) equals the depth of the body. The snout is moderately pointed and slightly longer than the diameter of the eye. The cleft of the mouth is wide and oblique, the upper maxillary extending nearly to below the centre of the eye. The snout is nearly scaleless, the upper maxillary and the mandibula exhibiting minute and rudimentary scales only; one-half of the præorbital covered with distinct and small scales. The eye is situated high up the side; the bony margin of the orbit is projecting, especially on the upper half, so that the space of the forehead between the eyes appears concave; the diameter of the eye is $4\frac{1}{3}$ in the length of the head, and much larger than the distance between the eyes.

All the other parts of the skull are thickly covered with scales; the *præoperculum* has the posterior limb finely serrated, one short and obtuse spine at the angle, and two longer ones of equal size at the lower limb; the lower limb and the angle form one continuous curve. The *operculum* has two very prominent spines, the lower of which is smaller.

The *dorsal fin* is rather low, with a notch before the soft portion; the scales of the body are continued on the lower half of this fin and of the others, and it is difficult to distinguish the real base of the fin. The first spine is above the base of the longest spine of the operculum, and equals in length the last spine; the second is twice as long as the first; the fourth is the longest, and $3\frac{1}{2}$ in the greatest depth of the body. The membrane between the spines appears to be deeply notched. The length of the base of the soft portion is one-third shorter than that of the spinous, and has the upper margin slightly convex; it is rather lower than the spinous, begins above the origin of the anal, and terminates so near the caudal, that the distance between these two fins is rather less than one-fourth of the depth of the body. The *caudal* fin is slightly rounded, and one-seventh only of the total length. The first spine of the *anal* fin is short, one-half the length of the second; the second is very thick, but shorter than the first ray, one-third of the depth of the body; the third spine is slender, and shorter than the preceding; the soft portion is slightly rounded, and its distance from the caudal is one-third of the depth of the body. The *pectoral* is well developed; its base is entirely hidden by scales; it is rounded, and extends to the level of the vent, its length being $4\frac{1}{2}$ in the total. The *ventrals* are much shorter than the pectorals, rather more than one-half; they are inserted a little before the pectorals, and their spine is three-fifths of their entire length.

The *scales* are of moderate size, finely ctenoid; those above the pectoral are largest, not much longer than high, and one covering about one-fourth of the eye. The lateral line runs in the upper third of the height of the body, and follows exactly the curve of the back.

The *teeth* are in villiform bands, with a pair of strong canines in both jaws; there is another canine tooth in the middle of the side of the lower jaw. The vomerine teeth are in a narrow band, rectangularly bent; the palatine teeth in a band not broader than that of the vomer.

The ground-colour is now pure yellowish, and has been probably red or rose-coloured. The bands are deep black: two (on each side) descend from the nape to the sides of the head; the anterior from the middle of the distance between the dorsal and the eyes to the upper posterior angle of the orbit; the other from the origin of the dorsal over the suprascapula to the middle of the hinder margin of the orbit; there is a black spot besides between the eyes; a third band, incomplete, on the operculum. The other bands are broader and vertical, and the first four extend on the dorsal fin: the first from between the third and fifth dorsal spines to behind the base of the pectoral; the second from between the seventh and ninth dorsal spines to the middle of the belly; the third from between the fourth and sixth dorsal rays to the anal spines; the fourth, rather curved, from between the twelfth and fourteenth dorsal rays to the end of the anal; finally, there are two other bands, much narrower than the anterior ones, on the tail. The fins are otherwise immaculate.

The native sea of this species is probably a part of the Pacific.

	inches.	lines.
Total length	8	0
Height of the body	2	9
Length of the head	2	9
Interspace between the eyes	0	5
Diameter of the eye	0	$7\frac{2}{3}$
Length of the fourth dorsal spine	0	$9\frac{1}{2}$
Interspace between dorsal and caudal	0	8
Interspace between anal and caudal	1	0
Length of the second anal spine	0	11
Length of the second anal ray	0	13
Height of a large scale	0	4
Length of a large scale	0	$3\frac{1}{3}$

7. **Plectropoma semicinctum.**

Cuv. & Val. ix. p. 442; *Gay, Chile, Zool.* ii. p. 153, *Ictiol.* pl. 2. f. 1.

D. $\frac{10}{18-20}$. A. $\frac{3}{7-8}$. L. lat. 45.

Præoperculum finely serrated behind, and with three equal and strong spinous teeth below, one of which is placed at the angle. Caudalis truncated. Red, with eight brown cross-bands, lost on the sides. The sides of the head with more or less distinct, irregular, brownish streaks.

San Juan Fernandez (Chili); Australia.

a. Adult: skin. Australia. Purchased of Mr. Warwick.
b–d. Half-grown: skins. Australia. Purchased of Mr. Warwick.
e. Half-grown: skin. Swan River.
f. Half-grown. Sine patria. From the Haslar Collection.

8. **Plectropoma susuki.**

Cuv. & Val. ii. p. 404; *Faun. Japon.* p. 11. pl. 4 (upper figure); *Richardson, Ichthyol. China,* p. 230.

D. $\frac{11}{14}$. A. $\frac{3}{9}$.

Præoperculum with fine denticulations behind, coarser at the angle; a single spinous tooth below. Caudalis rounded. Brownish grey, with eight or nine darker cross-bands.

Chinese and Japanese Seas.

9. **Plectropoma dentex.**

Cuv. & Val. ii. p. 394; *Quoy & Gaim. Astrol.* p. 660. pl. 4. f. 2; *Richardson, Erebus & Terror,* p. 117. pl. 57. f. 3–5.

D. $\frac{10}{18}$. A. $\frac{3}{8}$. Cæc. pylor. 7.

Præoperculum with a few inconspicuous denticulations behind, and three or four small spinous teeth below. Caudalis rounded. Olive, marbled with blackish; black spots on the sides of the head and on the snout.

King George's Sound.

a. Adult: stuffed. King George's Sound.

10. **Plectropoma cyanostigma.** (Plate XII.)

D. $\frac{13}{15}$. A. $\frac{3}{8}$. L. lat. 100.

Præoperculum with three spines beneath, the anterior of which is the strongest. Caudalis rounded; the second anal spine longest, curved. Brownish (in a dried state); head and body covered with round blackish spots, blue in the centre, and each covering about six scales.

Australian Seas.

a, b. Adult: skins. Australia. Voyage of H.M.S. Fly.
c, d. Adult: skins. Australia. Purchased of Mr. Warwick.
e. Adult. Port Jackson. Purchased of Mr. Gould.
f. Adult: skin. New Holland. From Mr. Gould's Collection.

Description.—Body oblong; its height is comprised four times in the total length, the length of the head $3\frac{1}{2}$. The head above is covered with scales to the nostrils,—the whole snout, the præorbital, the maxillary, and mandibulary being naked. The eye forms one-sixth of the length of the head, and is situated above at the side, interfering with the outline of the crown. The distance between the eyes is one-third smaller than their diameter; the præorbital broad—as broad as the diameter of the eye is long The upper maxillary does not reach to the vertical from the centre of the eye. The præoperculum has a rounded angle; the denticulations along the posterior limb are coarse and distant from one another, becoming gradually larger at the angle. The anterior spine of the lower limb is at least twice as long as the posterior, which is situated very near the angle. The sub- and interoperculum are entire. The operculum is provided with three spines, the upper of which is broadest, and distant from the middle; the latter is rather slender and projecting; the third is immediately beneath.

Both the portions of the *dorsal* fin are nearly equal in height, and have a rounded upper margin; the spinous portion is $1\frac{1}{2}$ as long as the soft; the first spine is rather more than half the length of the second; the fourth, fifth, and sixth are longest; the others gradually become shorter, the twelfth being rather shorter than the second; the thirteenth apparently belongs to the soft portion, being, again, a little longer; the first ray is one-third longer than the last spine. The *caudalis* is rounded. The soft portion of the *analis* is rounded, and rather higher than the dorsal; the spines are very strong, especially the second, which is slightly curved, and not much shorter than the longest of the dorsal fin. The *pectoralis* is rounded, longer than the ventral, and extends to the vent; it is composed of eighteen rays.

The *ventralis* is small, and supported by a spine half the length of the fin.

There are no prominent canine teeth, but there is a series of large teeth in each jaw in front and on the side.

The ground-colour in the dried specimens is brownish—perhaps brownish red in life; the head and body are covered all over with round blackish spots with a bluish centre, each covering about six scales. All the fins appear now of a uniform blackish-brown colour, but there seem to have been similar spots on the pectoral.

Length of the largest specimen 16 inches.

11. **Plectropoma cinctum.** (PLATE XIII. fig. A.)

D. $\frac{13}{15}$. A. $\frac{3}{9}$. L. lat. 100.

The height of the body is $3\frac{1}{3}$ in the total length, and the length of the head is one-third of the latter. Præoperculum strongly serrated, with three large spinous teeth at the lower limb, the anterior of which is the strongest. Caudalis rather rounded. Reddish brown, with six dark-brown cross-bands encircling the body and tail; sides of the head with two bands of the same colour from the eye to the opercles; fins black, and whitish-edged.

a. Fine specimen. Norfolk Islands. From the Haslar Collection.

Description.—The form of the body is oblong, similar to that of the Perch; its height is comprised $3\frac{1}{3}$ in the total length. The head is rather elongate, its length being one-third of the total. The snout is elongate, as in *Mesoprion*, twice the diameter of the eye; the upper surface of the head narrow, the distance between the eyes smaller than their diameter; the scales extend only to the nostrils,—the whole snout, præorbital, and upper maxillary bone being naked. The eye is rather small, only one-sixth of the length of the head; the nostrils, separated into a smaller round posterior opening and into an oval anterior one, are situated in front of the upper angle of the eye. The præorbital is broad, even broader than the hinder end of the maxillary bone, which reaches to below the centre of the eye. The præoperculum is provided with rather strong and distant denticulations, increasing in size towards the angle, and with three very strong spinous teeth at the lower limb, the anterior of which is the strongest; the angle of the præoperculum is rounded; the sub- and interoperculum are entire. The operculum has three spines, the upper of which is very remote from the others; the middle is the longest, projecting immediately above the lower one. Suprascapula conspicuously crenulated.

The spinous portion of the *dorsalis* is much lower and longer than the soft. The spines are strong: the second one-third longer than the first, the third one-third longer than the second; the fifth to the eighth longest, the ninth to the fourteenth gradually becoming shorter; finally, the fifteenth a little longer than the preceding, and apparently belonging to the soft portion; this portion is nearly twice as high as the preceding lowest part of the spinous dorsal, and has an entirely rounded upper margin. The *caudalis* is rounded. The soft part of the *analis* is partly enveloped by a thick encroachment of the scaly integument, and forms an oblong flap with a rounded inferior edge; the second spine is exceedingly thick, and even longer than the longest dorsal spine, also somewhat curved; the third spine is not quite twice the size of the second. The *pectoralis* extends rather farther than the ventral, to the third cross-band; it is composed of eighteen rays, rounded, and enveloped in a thick membrane. The *ventralis*, rather short, does not extend to the vent; it is rounded, with a thick membrane between the rays, and has a spine half the length of the fin.

There are three pairs of canines in each jaw, of rather small size; the vomerine and palatine teeth stand in very narrow series.

The ground-colour is a reddish brown, darker on the back. The dark-brown cross-bands and the interspaces of the ground-colour are nearly of the same breadth; the first passes from in front of the dorsal to the gill-opening above the operculum; the second from the interspace between the fourth and sixth dorsal spines vertically to the belly; the third from the twelfth to the fourteenth; the fourth from the middle of the soft dorsal fin to the middle of the anal; the fifth from the end of the dorsal round the tail; the sixth, narrow and indistinct, round the root of the caudal. The second to the fifth bands extend also more or less on the fins. On the side of the head a dark-brown streak runs from the back edge of the eye to the suprascapula, and a second oblique one from beneath the eye to the angle of the præoperculum; a brown streak behind the maxillary. The opercles and soft fins are indistinctly dotted with brown. All the fins, except the spinous dorsal, have a blackish-brown white-edged margin.

Length of the specimen 10″.

12. Plectropoma serratum.

Cuv. & Val. ii. p. 399; *Quoy & Gaim. Voy. Astrol. Poiss.* p. 662. pl. 2. f. 1; *Dumont d'Urville, Voy. au Pôle Sud, Poiss.* pl. 3. f. 1.

D. $\frac{13}{16}$. A. $\frac{3}{9}$. Cæc. pylor. 8.

Præoperculum strongly serrated behind, and with two large spinous teeth below, the anterior of which is the strongest. Caudalis truncated. Brown: an oblique blackish band from the eye to the angle of the præoperculum, and some black spots on the sides of the body.

King George's Sound.

13. Plectropoma aculeatum.

Cuv. & Val. vi. p. 523.

D. $\frac{13}{14}$. A. $\frac{3}{8}$.

Posterior limb of the præoperculum with coarse denticulations, gradually becoming larger towards the angle, the horizontal limb with three very strong spinous teeth; suboperculum with three acute spines at the lower angle. Caudalis truncated. Brown, with small, scattered blackish spots on the back and the dorsal fin. (*Val.*)

Banc des Aiguilles.

14. Plectropoma brasilianum.

Plectropoma brasilianum, *Cuv. & Val.* ii. p. 397.
? Plectropoma patachonica, *Jenyns, Zool. Beagle, Fishes,* p. 11.

D. $\frac{12}{15-16}$. A. $\frac{3}{7-8}$. [D. $\frac{13}{16}$. A. $\frac{3}{7}$ (*Cuv.*).] Cæc. pylor. 9.

Præoperculum finely serrated behind, and with four spinous teeth below. Caudalis truncated. Greyish brown, with irregular reddish bands.

Coast of Brazil.

The specimens described by Jenyns exhibit only three spinous teeth at the horizontal limb of the præoperculum.

a. Adult: stuffed. Sine patria.
b, *c*. Half-grown: stuffed. Sine patria.

15. Plectropoma chloropterum.

Cuv. & Val. ii. p. 398; *Poey, Memor. Cuba,* 1851, p. 73. lam. 9. f. 3.

D. $\frac{11}{18}$. A. $\frac{3}{9}$. L. lat. 70. Cæc. pylor. 8.

Præoperculum finely and equally serrated behind, and with two spinous teeth below, the anterior of which is the largest. Caudalis rounded. Olive, marbled with brownish black; throat white-spotted.

Caribbean Sea.

16. Plectropoma pictum.

Tschudi, Fauna Peruana, Ichthyol. p. 5.

D. $\frac{11}{17}$. A. $\frac{3}{9}$.

This species appears to be different from the preceding (*Pl. chloropterum*), although closely allied, according to the descriptions referred to.

Operculum with three spines; præoperculum serrated behind, and with two spinous teeth beneath, the anterior of which is the strongest, the other situated at the angle; fins and snout scaly. Caudalis rounded; the fourth dorsal spine longest; the third of the anal fin rather shorter than the second; pectorals extending beyond the front end of the anal fin. Silvery white, with rose-coloured markings. (*Tschudi.*)

Coasts of Chili and Peru.

17. Plectropoma monacanthus.

Müll. & Trosch. in Schomb. Hist. Barb. p. 665.

D. $\frac{11}{18-19}$. A. $\frac{3}{9}$.

A single strong spine in front of the angle of the præoperculum.

Brownish, with darker spots on the sides, and some rounded spots of a lighter colour on the belly, opercles, and cheeks.

In shallow water along the coast of Barbadoes; Falkland Islands.

a. Adult: stuffed. Falkland Islands. Presented by W. E. Wright, Esq.
b Adult: stuffed. West Indies. Purchased of Mr. Scrivener.
c. Adult: skin. West Indies. Purchased of Mr. Scrivener.

18. Plectropoma macrophthalmos.

Tschudi, Faun. Peruana, Ichthyol. p. 6

D. $\frac{10}{10}$. A. $\frac{3}{9}$.

Præoperculum serrated behind, with several spinous teeth beneath. Caudalis?; the third to sixth dorsal spines longest; the third of the anal fin longer than the second. Uniform greyish. (*Tschudi.*)

Coast of Chili (Lurin, Callao).

19. Plectropoma paytense.

Lesson, Voy. Coq. Zool. p. 233.

D. $\frac{10}{12}$. A. $\frac{3}{7}$.

Caudalis forked. Reddish grey, with five large yellow spots on the side.

Payta.

20. Plectropoma hispanum.

Cuv. & Val. ii. p. 386; *Poey, Memor. Cuba,* 1851, p. 72. lam. 4. f. 1.

D. $\frac{8}{12\text{–}13}$. A. $\frac{3}{7}$. Vert. 10/14. Cæc. pylor. 8.

Præoperculum finely serrated behind, and with a single spinous tooth below; suboperculum denticulated. Rose-coloured, with yellow streaks.

Martinique; Cuba.

21. Plectropoma puella*.

Cuv. & Val. ii. p. 405. pl. 37; *Ramon de la Sagra, Hist. Cuba, Poiss.* p. 18; *Poey, Memor. Cuba,* 1851, p. 62. lam. 9. f. 2.

D. $\frac{10}{14\text{–}15}$. A. $\frac{3}{7}$. L. lat. 60. L. transv. 8/20. Cæc. pylor. 5. Vert. 10/14.

The height of the body is only $2\frac{1}{2}$ in the total length. Præoperculum finely serrated behind, rather coarser denticulated below; sub- and interoperculum with exceedingly fine denticulations. Violet, with five or six black cross-bands, the middle of which is broadest, spanning from the fourth dorsal spine to the tenth; the soft part of dorsalis with fine darker streaks.

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* *Plectropoma vitulinum* (Poey, Memor. Cuba, p. 68) is closely allied to *P. puella*.

Caribbean Sea.

a. Adult: skin. Jamaica. From Dr. Parnell's Collection.
b. Adult: stuffed. America. Presented by Dr. Parnell.
c. Fine specimen. S. America. Presented by Sir R. Schomburgk.
d. Fine specimen. Sine patria. Presented by the Zoological Society.
e. Fine specimen. (Canton?) Presented by the Zoological Society.
f. Adult. From the Haslar Collection.

22. **Plectropoma indigo.**

Poey, Memor. Cuba, 1851, p. 69. lam. 3. f. 1.

D. $\frac{10}{14}$. A. $\frac{3}{6}$.

Allied to *Pl. puella*. Præoperculum finely serrated behind, with rather small spinous teeth beneath. Blue, with five bluish cross-bands, the middle of which is broadest; ventrals black; caudalis emarginate. (*Poey*.)

Cuba.

23. **Plectropoma bovinum.**

Poey, Memor. Cuba, 1851, p. 69.

D. $\frac{10}{15}$. A. $\frac{3}{7}$. Cæc. pylor. 6.

Præoperculum finely serrated behind, with rather small spinous teeth beneath. Dark blue, with eight lighter cross-bands. Caudalis emarginate. (*Poey*.)

Cuba.

24. **Plectropoma gummigutta.**

Poey, Memor. Cuba, 1851, p. 70. lam. 3. f. 2.

D. $\frac{10}{15}$. A. $\frac{3}{7}$.

Præoperculum serrated behind, and with rather stronger denticulations beneath. Caudalis emarginate. Yellowish, with two black, blue-edged spots before the eye; muzzle blue. (*Poey*.)

Cuba.

25. **Plectropoma gutta-varium.**

Plectropoma gutta-varium, *Poey, l. c.* pp. 70, 411.
—— melanorhina, *Guichen. Poiss. in Ramon. de la Sagra, Hist. Cuba*, p. 18. pl. 1. f. 1.

D. $\frac{10}{14-15}$. A. $\frac{3}{7}$.

Præoperculum serrated behind, and with rather stronger denticulations beneath. Caudalis emarginate. The anterior parts of the body yellow, the posterior black; fins yellow; a black, blue-edged spot in front of the eye.

Cuba.

26. Plectropoma chlorurum.

Cuv. & Val. ii. p. 406 *

D. $\frac{10}{15}$. A. $\frac{3}{7}$. Cæc. pylor. 4.

Præoperculum finely serrated behind, with three rather stronger denticulations at the angle, and with six at the horizontal limb. Uniform blackish brown; caudal and pectoral fins yellow, the other ones black.

Martinique.

27. Plectropoma unicolor.

Seba, iii. 27. 10.
Holocentrus unicolor, *Bl. Schn.* p. 322.
Plectropoma ephippium, *Cuv. & Val.* ii. p. 408.

D. $\frac{10}{15}$. A. $\frac{3}{7}$.

Muzzle pointed; præoperculum finely serrated behind, and with rather stronger denticulations below. Caudalis emarginate. Brownish: a black cross-band on the tail, a black spot in front of the eye, a narrow violet undulated line from the eye to the angle of the præoperculum; each scale on the breast with a small whitish speck in the centre.

East Indies?

a. **Adult**: stuffed. Sine patria.—Of uniform brown colour.

28. TRACHYPOMA †.

Seven branchiostegals. Teeth in villiform bands; without canine teeth; teeth on the palatine bones; tongue smooth. One dorsal, with twelve spines; the anal with three. Operculum with moderate points; præoperculum with spinous teeth at the lower limb, directed forward. Scales small. The number of pyloric appendages increased (13).

Pacific.

1. Trachypoma macracanthus. (Plate XIII. fig. B.)

D. $\frac{12}{14}$. A. $\frac{3}{6}$. L. lat. 65. Cæc. pylor. 13.

Similar to *Plectropoma cyanostigma*. The height of the body is $3\frac{1}{2}$ in the total length; the length of the head is one-third of the same. Posterior limb of præoperculum strongly denticulated; the inferior with three strong spinous teeth, the anterior of which is the largest; sub- and interoperculum entire. Caudalis rounded. Brownish (in spirits), covered all over with very small whitish, darker-edged specks.

a, b. Norfolk Islands. From the Haslar Collection.
c, d. Norfolk Islands. From the Haslar Collection.

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* *Plectropoma nigricans* (Poey, Memor. Cuba, 1851, p. 71.) and *Plectropoma accensum* (Poey, *l. c.* p. 72), both from Cuba, if not the same, are closely allied.

† From τραχὺς, spinous, and πῶμα. opercle.

Description —In habit similar to the Perch The height of the body is comprised $3\frac{1}{2}$ in the total length, the length of the head is one-third. The head above, in the occipital region, is rather broad and rounded, between the eyes it is much narrower (the distance of the eyes being only two-thirds of their diameter), and longitudinally grooved. The scales extend to the nostrils, which, forming on each side two round openings, are situated entirely on the upper surface of the head. The præorbital, the snout, and the jaws are naked. The eye is $3\frac{2}{3}$ in the length of the head, and the extent of the snout is rather shorter than its diameter. The upper maxillary reaches to below the centre of the eye. The præoperculum exhibits rather a coarse serrature at the posterior limb, some strong teeth at the angle, which is rounded, and three recurved spines at the lower limb, the anterior of which is the strongest and very long. The sub- and interoperculum are entire. The operculum is provided with three conspicuous spines, remote from one another, and the middle one most projecting. The suprascapula with two or three spinous teeth.

The soft portion of the *dorsalis* is rather higher, and one-third shorter, than the spinous. The spines become longer to the fourth, which is the longest, together with the fifth and sixth, and then gradually diminish in size to the last, which still somewhat exceeds the second spine. The soft portion has a rounded superior margin, the anterior rays being one-third longer than the last spine. *Caudalis* rounded. The *analis* is distinguished by the very long and strong second spine; it is longer than any of the dorsal spines, and exceeds even half the height of the body; the first spine is rather more than one-half the length of the third. The six rays form together a very short fin with a rounded margin; none of the rays exceed the second spine in length. The *pectoralis*, rounded, and composed of 16 rays, extends as far as the ventral—that is, a little beyond the vent. The *ventralis*, of moderate size and form, is supported by a spine more than half the length of the fin.

There is not the slightest vestige of a canine tooth in any of the specimens; the vomerine teeth are arranged in a triangular group, those on the palatine bones in narrow bands.

The coloration appears now to be brownish olive, being covered all over with round whitish (in life probably blue), dark-edged specks of the size of a scale.

Length of the largest specimen 7″.

29. POLYPRION.

Polyprion, *Cuv. Règne Anim.*; *Cuv. & Val.* ii. p. 21.

Seven branchiostegals. All the teeth villiform; without canines; teeth on the palatine bones and on the tongue. One dorsal, with eleven spines; the anal fin with three. Opercles denticulated; a strong, rough longitudinal ridge on the operculum. Scales small.

Mediterranean, and the European part of the Atlantic.

1. Polyprion cernium.

Amphibrion americanus, *Bl. Schn.* p. 205. t. 47.
Epinephelus oxygeneios, *Bl. Schn.* p. 301.
Scorpæna massiliensis, *Risso, Ichthyol. Nice,* p. 184 (not *Lacép.*).
Sciæna aquila, *Rosenthal, Ichthyotom. Tafeln,* pl. 16. f. 1.
Polyprion cernium, *Valenc. Mém. du Mus.* xi. p. 265; *Cuv. & Val.* iii. p. 21. pl. 42, viii. p. 475; *Yarrell, Brit. Fishes,* i. p. 19; *Cuv. Règne Anim. Ill.* pl. 9. f. 1.
Serranus (Polyprium) Couchii, *Yarrell, Brit. Fishes,* i. p. 12.
Stone-Basse, *Couch, Linn. Trans.* xiv. p. 81.

D. $\frac{11}{11-12}$. A. $\frac{3}{8-9}$. Vert. 13/13. Cæc. pylor. 2.

The height of the body equal to the length of the head, and one-third of the total. Uniform brown; caudalis rounded, with a whitish edge.

Mediterranean; Madeira; coasts of Portugal, France, and England.

a. Large specimen: stuffed. Plymouth. Mr. Yarrell's Collection.
b. Adult. Mediterranean.
c. Adult: stuffed. Sine patria. Mr. Yarrell's Collection (*Polyprion couchii*).
d. Adult: head, dried.

30. POGONOPERCA*.

A barbel at the lower jaw. Seven branchiostegals. All the teeth villiform; without canines; teeth on vomer and palatine bones. Dorsal deeply notched; the first with seven, the anal with three spines. Operculum spiniferous; præoperculum denticulated. Scales minute, imbedded in the skin.

1. Pogonoperca ocellata. (Plate XIV fig. A.)

D. $7 \mid \frac{1}{12}$. A. $\frac{3}{8}$.

Barbel about as long as the diameter of the eye. Brownish, covered all over with small round white dots; three or four large brown blotches on the back (in dried state).

a. Adult: stuffed. *Hab.* ——?

Description of the specimen.—The height of the body is one-fourth of the total length, the length of the head is $3\frac{1}{3}$ in the same. The upper surface of the head is short and narrow, the interspace between the eyes being one-ninth only of the length of the head. The snout is short, the cleft of the mouth oblique, the lower jaw prominent. There is a broad and well-developed barbel at the symphysis of the mandibulæ; it is rather longer than the diameter of the eye, and coloured like the body. The intermaxillary does not reach to the end of the maxillary, and is furnished with a broad band of villiform teeth, corresponding to a similar band in the lower jaw; the vomerine teeth are arranged at a right angle; the band of palatine teeth is short and narrow. The upper maxillary is styliform at its upper end only, and soon becomes broad, but is scarcely broader at its lower end than in the middle; it appears to reach behind the middle of the eye—perhaps to the posterior margin of the orbit. The eye is placed high up the side of the head, interfering with the upper outline of the head, and is of moderate size, its diameter being $5\frac{1}{3}$ in the length of the head. Operculum with three spines: the middle is the largest, flat, and much projecting; the upper is similar, but smaller; the lower is more distant, very small, and nearly hidden by the skin. The præoperculum is rounded, and armed behind with coarse, irregular, obtuse spinous teeth; the sub- and interoperculum appear to be entire. The specimen is so prepared that the branchiostegals may be seen; there are on one side distinctly seven, but on the other I count six only.

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* From πώγων, beard, and πέρκη, perch.

The spinous dorsal is connected with the soft by a distinct membrane; its base is much longer than that of the soft—nearly as long as the body is high. The spines are strong; the third is the longest, about half the length of the base of the spinous fin. There are seven spines—an eighth apparently belonging to the soft dorsal. The first spine is the shortest, and equal to the eighth; the second and fourth are not much lower than the third. The soft dorsal has been rounded, and is rather higher than the spinous. The caudal rounded. The anal has three spines in front, the second of which is strongest and rather curved, but scarcely longer than the third. Pectoral and ventral fins rounded; the base of the spine of the latter falls just below the root of the former.

The scales must have been very small and thin, and imbedded in the skin, as in the Tench. The coloration is reddish brown on the back, lighter beneath; all the parts, except the upper portion of the spinous dorsal, are covered with small, round, yellowish-white spots, each of which, on the body, may have corresponded in life to a scale. There is a large brown blotch in front of the dorsal, between the occiput and the operculum; a second smaller one extends below the fourth to the sixth dorsal spine; a third below the middle of the soft dorsal; a fourth on the back of the tail.

	inches.	lines.
Total length	12	0
Height of the body	2	11
Length of the head	3	$6\frac{1}{2}$
——— of the barbel	0	4
——— of the upper maxillary	1	$5\frac{1}{2}$
——— of the opercular spine	0	$5\frac{1}{2}$
——— of the third dorsal spine	1	3
——— of the caudal	1	9
——— of the second anal spine	0	4
——— of the pectoral	1	8
——— of the ventral	1	7

31. GRAMMISTES.

Grammistes, (*Artedi*) *Cuv. Règne Anim.*; *Cuv. & Val.* p. 201.

Seven branchiostegals. All the teeth villiform; without canines; teeth on the palatine bones; tongue smooth. Two dorsals; the first with seven, the anal fin without conspicuous spines. Operculum and præoperculum spiniferous, without serratures. Scales minute, enveloped in the epidermis.

Seas of the Indian region.

1. Grammistes orientalis.

Grammistes sebæ, *Seba*, iii. 27. 5.
—— orientalis, *Bl. Schn. Syst. Posth.* p. 189; *Cuv. & Val.* ii. p. 203. pl. 27; *Bleeker, Amboina*, iii. p. 15.
Perca bilineata, *Thunb. Nov. Act. Holm.* xiii. p. 142. t. 5.
Sciæna vittata, *Lacép.* iv. p. 323.
Perca triacanthus, *Lacép.* pp. 398, 424.
—— pentacanthus, *Lacép.* pp. 398, 424.

$$\text{D. } 7 \left| \tfrac{1}{13}. \right. \quad \text{A. } \tfrac{0}{8}.$$

Body oblong, compressed; caudal rounded. Præoperculum with three spines. Tendril rudimentary. Black or blackish brown; generally with six or seven white longitudinal bands.

Isle de France; East Indian Seas; Australia.

a. Adult. Mauritius. Presented by the Zoological Society.
b. Adult: stuffed. Mauritius.
c. Adult. Philippines.
d. Half-grown: stuffed. Indian Ocean. Presented by Sir A. Smith.
e. Half-grown. Australia. Presented by J. Macgillivray, Esq.

2. Grammistes punctatus.

Cuv. & Val. vi. p. 504.

$$\text{D. } 7 \left| \tfrac{1}{9}. \right. \quad \text{A. } \tfrac{0}{8}.$$

Tendril developed. Præoperculum with three spines. Greyish brown with small white points.

Hab. ——?

32. RHYPTICUS.

Rypticus, *Cuv. Règne Anim.*; *Cuv. & Val.* iii. p. 60.
Smecticus, *Valenc. Poiss. Voy. de la Vénus*, p. 305.

Seven branchiostegals. All the teeth villiform, without canines; teeth on the palatine bones; tongue smooth. Scales minute, enveloped in the epidermis. The spinous dorsal little developed, with the number of the spines variable; spines of the anal fin none, or small. Operculum and præoperculum spiniferous. Air-bladder simple. Pyloric appendages in small number.

Warmer parts of the Atlantic; Galapagos Archipelago.

1. **Rhypticus saponaceus.**

Parra, p. 51. pl. 54. f. 2.
Anthias saponaceus, *Bl. Schn.* p. 310.
Rypticus saponaceus, *Cuv. & Val.* iii. p. 63.

D. $\frac{3}{25}$. A. $\frac{1}{17}$. Cæc. pylor. 6–7. Vert. 10/14.

One continuous dorsal. The length of the head equals the height of the body, and rather more than one-fourth of the total length. Dorsalis gradually becoming higher behind; pectoral rounded, moderate; ventral small. Brown.

Coasts of Tropical America; Cape of Good Hope; St. Helena; Cape Verde.

a. Adult: stuffed. Cape of Good Hope. Presented by Sir A. Smith.
b. Adult: stuffed. St. Helena. Presented by Gen. Hardwicke.
c, *d*. Adult: stuffed. W. Indies. From Mr. Scrivener's Collection.
e. Adult. St. Vincent's. Presented by the Lords of the Admiralty.
f–h. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.
i. Adult. America. Presented by the Zoological Society.
k. Half-grown: skeleton. From the Haslar Collection.

Skeleton.—The form of the skull deviates in many respects from that of the *Serrani*. The supraoccipital crest is low, and does not extend beyond the supraoccipital bone. The portion of the skull formed by the parietal and frontal bones is very compressed, smooth, without ridges, and cylindrically rounded; the space between the eyes is still narrower, with a groove in front for receiving the posterior processes of the intermaxillary. The præorbital has an entire, rounded, lower margin, tapering behind; the suborbital arch is very narrow, but supported at the inner side by a long and broad plate, which renders this arch very firm, and supports the eye from beneath; this plate occupies about one-third of the circle of the orbit. The maxillary bone gradually widens behind, and has a rather concave posterior and a convex anterior margin. There is a large open space between the dentary and articulary bones of the mandibula. The præoperculum is narrow, crescent-shaped, without any prominent angle, and with two equal, flat, and triangular spinous teeth at its upper half; there is another smaller and obtuse tooth above these larger ones. The sub- and interoperculum are entire. The area of the operculum is hardly larger than the eye; it is provided behind with three prominent spines, the middle of which is the longest, and the continuation of a strong ridge, visible at the inner surface of the operculum; the two upper spines are nearer together, and the uppermost is situated at the upper angle of the opercle.

There are ten abdominal and fourteen caudal vertebræ. The neural spines of the first seven vertebræ are strong, compressed, and the more recumbent the more posteriorly situated; the posterior ones are also shorter. The ribs are short, but thicker than in *Serranus*. There is only one rudimentary anal spine, and consequently the interhæmal is very feeble and slender, attached to the eleventh hæmal spine. The pubic bone is as feeble as the ventral fin itself; it is composed on each side of two narrow laminæ, forming together a channel.

All the teeth form rather broad villiform bands; in both the jaws they extend to the posterior extremity of the bone; those of the vomer are arranged in a triangular patch with emarginate hinder side.

2. Rhypticus arenatus.

Cuv. & Val. iii. p. 65. pl. 45.

D. $\frac{3}{26}$. A. $\frac{0}{14}$.

One continuous dorsal. Greyish brown, punctulated with brown. Coast of Brazil; Jamaica.

a. Half-grown. Jamaica. From Dr. Parnell's Collection.
b, c. Half-grown: skins. Trinidad. Presented by J. B. Richardson, Esq.

3. Rhypticus maculatus.

Holbr. Ichthyol. S. Carol. p. 39. pl. 6. f. 2.

D. 2 | 25. A. $\frac{0}{15}$. Cæc. pylor. 4.

The two dorsal spines separated from the soft portion. Olive-brown with whitish spots. (*Holbr.*)

Cape Romain (coast of S. Carolina).

4. Rhypticus bicolor.

Smecticus bicolor, *Valenc. l. c.* p. 307. pl. 2. f. 2.

D. 10 | 21. A. $\frac{2}{15}$.

Crimson, marbled with lighter; all the fins black.

Galapagos Archipelago.

33. AULACOCEPHALUS.

Aulacocephalus, *Temm. & Schleg. Faun. Japon.* p. 15.

Seven branchiostegals. All the teeth villiform; without canines; palatines?; tongue?. One dorsal, with nine spines, the anal fin with three. Operculum with three points; præoperculum strongly serrated at the lower limb. Scales small.

Indian Ocean.

1. Aulacocephalus schlegelii.

Aulacocephalus, sp., *Faun. Japon.* p. 15. pl. 5. f. 2.

D. $\frac{9}{13}$. A. $\frac{3}{10}$.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head is more than one-third of it. Sub- and interoperculum denticulated; suprascapula pointed. Violet; on each side of the back a broad yellow band, running from the muzzle through the eye along the dorsal fin to the upper part of the dorsal fin.

Coasts of the Mauritius and Japanese Seas.

a, b. Adult and half-grown: stuffed. Isle de France. Presented by Dr. Janvier.

34. DIPLOPRION.

Diploprion, (*Kuhl & van Hasselt*) *Cuv. & Val.* ii. p. 137.

Seven branchiostegals. All the teeth villiform; without canines; teeth on the palatine bones; tongue smooth. Two dorsals, the first with eight, the anal fin with two spines. Operculum spiniferous, præoperculum with double denticulated limb. Scales small.

Seas of the Indian region.

1. Diploprion bifasciatum.

Diploprion bifasciatum, (*Kuhl & van Hasselt*) *Cuv. & Val.* ii. p. 137. pl. 21; *Faun. Japon.* p. 2. pl. 2. A; *Richards. Ichthyol. China*, p. 222; *Bleek. in Verhand. Batav. Genootsch.* xxvi. p. 59, *and Natuurk. Tydschr. Nederl. Ind.* vi. 1854, p. 207.

D. 8 | 15. A. $\frac{2}{12}$. Vert. 12/13. Cæc. pylor. 3.

Body $2\frac{1}{2}$ as long as high, compressed; the first dorsal fin half as high as trunk; ventrals long, pointed. Yellowish, with two broad black cross-bands.

Japanese, Chinese, and Javanese Seas; Moluccas.

a, b. Adult. China. Presented by J. R. Reeves, Esq.
c. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
d. Half-grown. China. Presented by J. R. Reeves, Esq.
e–h. Adult. China.
i, k. Half-grown. Hong Kong. From the Haslar Collection.
l. Large specimen. Japan. Purchased of Mr. Frank.
m. Adult: stuffed. Japan. From Mr. Frank's Collection.
n. Adult. Molucca Islands. From Mr. Frank's Collection.
o. Half-grown: stuffed. India.
p–s. Half-grown: not good state. India.

35. MYRIODON.

Centropristes, sp., *Cuv. & Val.* iii. p. 48.
Myriodon, *Brisout de Barneville, Rev. Zool.* 1847, p. 133.

Seven branchiostegals. All the teeth minute, villiform; teeth on the palatine bones; tongue smooth. One dorsal, with twelve or thirteen spines, the anal fin with three. Operculum spiniferous; præoperculum denticulated, with spinous teeth at the lower limb, directed forward. Scales moderate. The number of pyloric appendages small (none?).

Seas of the Australian region.

1. Myriodon waigiensis.

Scorpæna waigiensis, *Quoy & Gaim. Voy. Freyc. Zool.* p. 324. pl. 58. f. 1.
Centropristes scorpænoides, *Cuv. & Val.* iii. p. 48; *Richards. Ann. & Mag. Nat. Hist.* 1842, vol. ix. p. 120.
Myriodon scorpænoïdes, *Bris. de Barnev. Rev. Zool.* 1847, p. 130; *Bleeker, Riouw.* p. 480.

D. $\frac{12-13}{9-12}$. A. $\frac{3}{5}$. L. lat. 42. L. transv. 8/17. Vert. 9/16.

The height of the body is one-third of the total length and equal to the length of the head; the diameter of the eye is one-third of the latter. On each side between the two nasal openings a short membranaceous appendage. Præoperculum with three or four spinous teeth beneath, directed forward; operculum with a single spine. Caudalis very slightly emarginate; the second spine of the anal very long and strong. Greyish, marbled with grey and brown.

Riouw; Waigiou; Port Essington.

a. Adult. Port Essington. Presented by J. Gould, Esq.
b. Adult: injured. Port Essington. From the Haslar Collection.
c. Adult: stuffed. Port Essington.
d. Young: dried. Freycinet's Harbour. Voyage of H.M.S. Herald.
e. Half-grown. Australia. Presented by Sir J. Richardson.
f. Adult: skeleton. Australia. From the Haslar Collection.
g. Adult. Purchased of Mr. Brandt.

A good description of the *skeleton* is given by Sir J. Richardson, *l. c.* p. 125.

36. GENYOROGE *.

Diacope, sp., *Cuv. Règne Anim.*; *Cuv. & Val.* ii. p. 410; *Rüpp. Atlas*, p. 70.
Mesoprion, sp., *Bleeker.*
Genyoroge, *Cantor, Catal.* p. 12.

Seven branchiostegals. Teeth villiform, with canines in both jaws; teeth on the palatine bones; tongue smooth. One dorsal with ten or eleven, rarely with more spines; the anal fin with three. Operculum with two or three points; above the angle of præoperculum a deep notch, as deep as broad, receiving a more or less spinous knob of the interoperculum. Scales moderate.

From the Red Sea through all the seas of the Indian region extending into the Pacific.

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* 1. Diacope duodecim-lineata, *Cuv. & Val.* vi. p. 529.—Isle de France.
2. —— rufolineata, *Cuv. & Val.* vi. p. 531.—New Guinea.
3. —— axillaris, *Cuv. & Val.* vi. p. 532.—East Indies.
4. —— flavipes, *Cuv. & Val.* vi. p. 534.—Vanicolo.
5. —— analis, *Cuv. & Val.* vi. p. 534.—Isle de France.
6. —— aurantiaca, *Cuv. & Val.* vi. p. 536.—Vanicolo.
7. —— sanguinea, *Cuv. & Val.* ii. p. 437.—Red Sea.
8. —— vitianus, *Hombr. & Jacq. Voy. au Pôle Sud, Poiss.* p. 37. pl. 2. f. 2.—Polynesia.

1. Genyoroge nigra.

Sciæna nigra, *Forskal, Descr. Anim.* p. 47.
Lutjanus niger, *Bl. Schn.* p. 326.
Diacope nigra, *Cuv. & Val.* ii. p. 431; *Rüpp. N. W. Fische*, p. 93. t. 24. f. 1.

D. $\frac{10}{13-15}$. A. $\frac{3}{10-11}$. L. lat. 45–50.

The height of the body is more than one-third of the total length; the length of the head is $3\frac{2}{3}$ in the same; the upper profile of the head is very convex, forming a quarter of a circle. Præoperculum serrated, with stronger denticulations at the angle; the prominence of the interoperculum like a spine, directed forwards. Pectoral fins long, reaching to the front end of the anal; caudal truncated. Uniform black.

Red Sea.

a. Adult: stuffed. Red Sea.

2. Genyoroge macolor.

Macolor, *Renard*, i. pl. 9. f. 60, ii. pl. 7. f. 30; *Valent.* iii. p. 348. pl. 1. f. 1.
Diacope macolor, *Cuv. & Val.* ii. p. 415, *Less. Mém. Soc. Hist. Nat.* iv. p. 409, and *Voy. Coq. Zool.* ii. p. 230. pl. 22. f. 2.
Mesoprion macolor, *Bleek. Celeb.* iii. p. 752.

D. $\frac{10}{14}$. A. $\frac{3}{10}$. Cæc. pylor. 4.

Præoperculum indistinctly serrated. Caudalis truncated; pectoral and ventral fins very long, reaching far beyond the front end of the anal. Black, belly lighter; a series of three white spots along the base of dorsal fin, two other spots below; a white band along the sides; head with two white cross-bands; fins black; caudal with white tips, and anal with a white posterior margin.

New Guinea; Amboyna; Celebes.

a. Adult. Molucca Sea. Purchased of Mr. Frank.
b, *c*. Adult. Amboyna. Purchased of Mr. Frank.
d. Half-grown. Amboyna. Purchased of Mr. Stevens.

3. Genyoroge sebæ.

Seba, iii. 27. 2; *Russell*, pl. 99.
Diacope sebæ, *Cuv. & Val.* ii. p. 411.
—— siamensis, *Cuv. & Val.* vi. p. 524.
Mesoprion sebæ, *Bleeker, Perc.* p. 45.

D. $\frac{11}{16}$. A. $\frac{3}{9-11}$. L. lat. 40. Cæc. pylor. 4 (5 *Cuv.*). Vert. 10/14.

Head one-third of the total length, equal to the height of the body; the diameter of the eye is $4\frac{1}{2}$ in the length of the head; the vertical and horizontal margins of the præoperculum serrated; caudal fin emarginate. Yellowish, with three broad blackish (reddish-violet) cross-bands.

Coast of Pondicherry; Seas of Java, Amboyna, Waigiou; Louisiade Archipelago; Coast of Mozambique.

a. Adult. India. Presented by Sir J. Richardson.
b. Adult: stuffed. Louisiade Archipelago (15 fathoms). Voyage of the Rattlesnake.
c. Adult: skeleton. Amboyna. From Mr. Frank's Collection.
d. Adult: stuffed. Mozambique. Presented by T. Thompson, Esq.

Skeleton.—The skull is distinguished not only by the development of all the bones situated in a vertical direction, as we find usual in *Genyoroge*, but by much more developed muciferous channels than in *G. bengalensis*, offering a further example of how little importance is the generic character drawn from this modification of the bones. The occipital crest is exceedingly high, with a rounded superior angle, and extends far between the orbits; in front it is separated into two laminæ, which, parting from each other in *G. bengalensis*, are close together in this species. There are two other ridges on each side of this crest, both arising from above the orbit: the interior, parallel to the occipital crest, articulates with one of the processes of the suprascapula, and terminates behind in a prominent spinous point; the exterior muciferous ridge descends in an oblique direction and articulates with the other process of the suprascapula. The space between the eyes is very uneven on account of ridges and cavities. The præorbital bone is large, as large as the area of the eye, trapezoidal, and partly excavated by flat and low muciferous cavities; the suborbital arch muciferous, but otherwise as in *G. bengalensis*. The maxillary bone short, not longer than the præorbital, gradually widening behind, with a nearly straight-lined upper edge and a rather concave one beneath. The operculum has only one very short point, forming the end of an interior low crest; there is only a rounded prominence at the place where another point is generally found; it is produced by an emargination beneath. The præoperculum is minutely serrated above and partly in the notch, the denticulations being coarser, and radiating at the angle and the inferior limb; the sub- and interoperculum are entire; the knob of the latter is an obtuse point directed upward. The coracoid bone as in *G. bengalensis*.

Of the entire system of muciferous channels, that pair running along the upper surface of the skull is most developed; it is formed by the turbinal, entirely modified into a tube, and by the principal frontal bones. This channel has three openings: in front, the anterior opening of the turbinal; secondly, an opening formed by a turbinal and frontal bone together; finally, a third in the frontal bone alone, above the anterior margin of eye; this channel is blind behind and does not communicate with the second, as in *Acerina cernua*. The second arises from above the posterior margin of the orbit, and soon separates into two stems: one of them, the *scapular* stem, follows the exterior ridge on the parietals, and being curved upwards and backwards, passes into the suprascapula and the upper suprascapular process, where it is lost: the other, the *suborbital* stem, follows the suborbital arch and expands on the præorbital; its openings are small and irregular. The third, or rather the fourth channel, runs along the inner part of the præoperculum, is in communication with the scapular stem, and passes beneath on the mandibula; there are several small openings on the præoperculum, but not so regular as those on the mandibula, where we find distinctly three: an entrance-opening behind on the articulary, a second between the angular and dentary, a third on the dentary, and, besides, a few very small irregular ones in front. Thus we have here, with slight modifications, and in a rather less developed degree, the same muciferous system as in *Acerina cernua*, or, in fact, in all the Percoids, but in a more or less rudimentary state.

The length of the abdominal vertebral column is to that of the caudal as 11 : 17. The first interhæmal spine is trihedral, of moderate size, and attached to the eleventh hæmal; its length is equal to that of the second vertebra to the ninth.

There are two rather small canines on each side of the upper jaw: the villiform band reaches to the end of the bone, and has several stronger teeth in the outer row. In the lower jaw the villiform band does not extend on the sides of the bone, there being only a single series of stronger teeth, continued also on the front of the jaw. Separate canines cannot be distinguished. The band on the vomer forms a rather obtuse angle; that on the palatine bones is short and narrow.

4. Genyoroge bengalensis.

Renard, Poiss. i. t. 20. f. 110; *Valentyn, Ind.* iii. f. 25.
Sciæna kasmira, *Forskal*, p. 46.
Holocentrus bengalensis, *Bloch*, t. 246. f. 2; *Bl. Schn.* p. 316
—— quinquelinearis, *Bloch*, t. 239.
Grammistes kasmira, *Bl. Schn.* p. 189.
Labrus octolineatus, *Lacép.* iv. p. 478. pl. 22. f. 1.
—— kasmira, *Lacép* iii. p. 483.
Perca polyzonias, *Forst. Anim. cur. Licht.* p. 225.
Diacope octolineata, *Cuv. & Val.* ii. p. 418, vi. p. 526; *Faun. Japon.* p. 12. pl. 6. f. 2; *Richards. Ichthyol. China*, p. 229.
—— decemlineata, *Cuv. & Val.* vi. p. 528.
Mesoprion etaape, *Less. Voy. Coq. Zool.* p. 229.
—— octolineatus, *Bleeker, Perc.* p. 40.

The length of the head is equal to the height of body, and 3½ in the total; the diameter of the eye is 3½ in the length of the head. The vertical and the horizontal margins of the præoperculum denticulated. Caudal fin emarginate. Yellowish; on each side four or five blue longitudinal bands.

Red Sea; Isle de France; East Indian Seas; Polynesia.

a, *b*. Adult. China.
c. Adult: skeleton. India.
d, *e*. Adult. India. Old Collection.
f. Half-grown: bad state. India. From Mr. Frank's Collection.
g. Fine specimen. Feejee Islands. Voyage of the Herald.
h. Adult: stuffed. Louisiade Archipelago; Chaumont Island. Voyage of the Rattlesnake.

i. Adult: stuffed. Louisiade Archipelago (in 15 fathoms; sand and shells). Voyage of the Rattlesnake.
k. Adult: stuffed. Louisiade Archipelago. Presented by the Lords of the Admiralty.
l, m. Half-grown: stuffed. Louisiade Archipelago. Presented by the Lords of the Admiralty.
n–p. Half-grown. Amboyna. Purchased of Mr. Frank.
q. Adult: stuffed Isle de France.
r. Half-grown: stuffed. Red Sea. From the Frankfort Museum.

Skeleton.—The external appearance of the species of *Genyoroge* exhibiting a more elevated form than the *Serrani*, we find all the bones situated in a vertical direction, higher, and more developed. The horizontal part of the occipital crest is as broad as the vertical, bifid in front, and extending between the orbits. There are two other ridges on each side of this crest, such as may be found more or less developed in the *Serrani*: the interior, parallel to the occipital crest, arises above the middle of the orbit, articulates with one of the processes of the suprascapula, and terminates on the paroccipital bone, with a point directed backwards; the exterior ridge arises from above the suborbital arch, descends in an oblique direction, and articulates with the other process of the suprascapula. The space between the orbits is neither concave nor convex, uneven, with several low ridges and grooves; the præorbital bone is large, trapezoidal, and broader than the space between the orbits; the suborbital arch is very narrow, and provided at its inner side with a broad, thin, concave plate for supporting the eyeball from beneath (as in *Serranus*). The maxillary bone gradually widens behind, with a rather convex superior margin and a rather concave inferior one. The operculum with an upper entirely rounded point, and with a lower moderate, acute spine; the præoperculum is minutely serrated above the notch, the denticulations becoming coarser at the angle and at the lower limb; sub- and interoperculum entire; the knob of the latter is a true spine, directed upwards. The coracoid bone is formed, as usual, of two bones; but they are here very broad, the lower terminating in a point. The first interhæmal spine is strong, equal to the length of the second vertebra to the eighth, and is fixed to the hæmal of the tenth. There is a pair of strong canines on each side of the upper jaw; those of the lower jaw are very small; the teeth of the exterior series in the mandibula gradually become larger on the middle of the dental bone, and again decrease in length behind; the series of vomerine teeth forms an obtuse angle.

5. Genyoroge cæruleovittata.

Diacope cæruleovittata, *Cuv. & Val.* vi. p. 530.

D. $\frac{11}{13}$. A. $\frac{3}{9}$.

Eight blue longitudinal bands on each side. Eye very large. (*Val.*) Isle de France.

6. Genyoroge viridis.

Diacope viridis, *Valenc. Voy. Vénus, Zool.* p. 303. pl. 1. f. 2.

D. $\frac{11}{14}$. A. $\frac{3}{9}$. L. lat. 55.

Greenish, with four straight, dark green longitudinal bands. (*Val.*)
Galapagos Archipelago.

7. Genyoroge octovittata.

Diacope octovittata, *Cuv. & Val.* vi. p. 528.

D. $\frac{12}{13}$. A. $\frac{3}{8}$. Vert. 11/14.

On each side four broad (blue?) longitudinal bands; dorsal fin with a broad white margin.

Isle de France.

a. Adult: skeleton. Isle de France. From Mr. Gerrard's Collection.

The comparison of the *skeleton* of this species with that of *G. bengalensis* proves the real difference of both species. The general structure of the skeleton is much the same; but, besides the difference in the number of the fins and of the vertebræ, the frontal bones are much broader, especially behind, where they form a conspicuous flat vault: the distance between the orbits is larger than one-half of the horizontal diameter of the osseous orbit, the same distance in *G. bengalensis* being smaller than one-half of that diameter. The first interhæmal spine is equal to the length of the second to the seventh vertebra, and is attached to the twelfth and thirteenth.

8. Genyoroge rosea.

Diacope rosea, *Cuv. & Val.* vi. p. 537.

D. $\frac{13}{12}$. A. $\frac{3}{8}$.

Rose-coloured (in life); dorsal orange, with blue spots; anal and ventral fins blue. (*Val.*)

Sea of Ulea (Caroline Islands).

9. Genyoroge gibba.

Sciæna gibba, *Forsk.* p. 46.
Lutjanus gibbus, *Bl. Schn.* p. 326.
Diacope coccinea, (*Ehrenb.*) *Cuv. & Val.* ii. p. 437; *Rüpp. N. W. Fische*, p. 91. t. 23. f. 2; *Peters, Wiegm. Archiv*, 1855, p. 238.
—— gibba, *Cuv. & Val.* ii. p. 438.

D. $\frac{10}{14}$. A. $\frac{3}{8-9}$.

The length of the head is 3½ in the total, and the height of the body 2¾ in the same. The upper profile of the head gibbous above the eyes; muzzle elongate, pointed. Pectorals pointed, hardly reaching to the front end of the anal; caudal notched. Uniform reddish rose-coloured, with two rather irregular yellow streaks passing from the muzzle below the eye to the pectorals; dorsal, anal, and ventral fins with white posterior edges.

Red Sea; Coast of Mozambique.

10. Genyoroge notata.

Russell, pl. 98.
Diacope notata, *Cuv. & Val.* ii. p. 422.
Genyoroge notata, *Cantor, Catal.* p. 12.

$$D. \frac{10}{14}. \quad A. \frac{3}{8}.$$

Back reddish brown; a black blotch on the lateral line (according to Valenciennes, above the lateral line); from the orbit, above the lateral line, three obliquely ascending orange lines, of which the lowest reaches to the middle of the base of the dorsal rays; beneath the lateral line three or four similar parallel lines, of which the uppermost divides the black spot; the rest nearly straight from the operculum towards the tail.—*Young*: head above and back brownish; stripes of the body brown. (*Cantor.*)

Sea of Pinang; Bay of Bengal.

Mesoprion russellii, Bleeker, seems to be a different species, belonging to the group with a superficial notch at the vertical margin of the præoperculum.

11. Genyoroge marginata.

Diacope marginata, *Cuv. & Val.* ii. p. 425; *Peters, Wiegm. Archiv*, 1855, p. 238.
—— xanthopus, *Cuv. & Val.* iii. p. 495.
Mesoprion marginatus, *Bleeker, Amboina*, ii. p. 554.

$$D. \frac{10}{14}. \quad A. \frac{3}{8}. \quad L. lat. 50–55.$$

Uniform yellowish (in a dried state); dorsal, anal, and caudal fins with a black and whitish edge. The height of the body is $3\frac{1}{3}$ in the total length, the length of the head $3\frac{2}{5}$; the diameter of the eye is one-fourth of the length of the head. Pectoral fins pointed, long, reaching to the spinous part of the anal fin. Caudalis notched.

Louisiade Archipelago; Amboyna; Ceylon; Coast of Mozambique.

a, b. Adult: skin. Ceylon. Presented by the Zoological Society.
c. Half-grown. Amboyna. Purchased of Mr. Stevens.
d. Young. Amboyna. Purchased of Mr. Frank.
e, f. Half-grown: stuffed. Louisiade Archipelago. Presented by the Lords of the Admiralty.
g, h. Half-grown. From the Collection of the Zoological Society.

12. Genyoroge bottonensis.

Holocentrus boutton, *Lacép.* iv. pp. 331, 367.
Diacope bottonensis, *Cuv. & Val.* ii. p. 434, vi. p. 535.
Mesoprion bottonensis, *Bleeker, Natuurk. Tydschr. Nederl Indie*, ii. p. 170.
—— jauthinurus, *Bleeker, l. c.* vi. p. 52.

$$D. \frac{10}{14–15}. \quad A. \frac{3}{8}. \quad L. lat. 65.$$

The height of the body equals the length of the head, and is $3\frac{1}{4}$ in the total; the diameter of the eye one-fourth of the length of the head. Denticulations of the lower margin of the præoperculum rather stronger than those of the posterior; caudalis notched; pectoral fins reaching to the base of the anal; the third, fourth and fifth dorsal spines longest; the second anal spine longer and stronger than the third. Red: brownish red on the back, with numerous oblique darker bands above the lateral line; fins immaculate.

Sumatra; Amboyna; New Guinea.

a. Adult. Amboyna. From Mr. Frank's Collection.
b. Half-grown. Amboyna. From Mr. Frank's Collection as Mesoprion annularis.
c, d. Half-grown and young. Amboyna. From Mr. Frank's Collection.

13. Genyoroge rivulata.

Diacope rivulata, *Cuv. & Val.* ii. p. 414. pl. 38; *Rüpp. N. W. Fische*, p. 94.
? Diacope alboguttata, *Cuv. & Val.* vii. p. 445.

D. $\frac{10}{14-16}$. A. $\frac{3}{8-9}$. L. lat. 54. Cæc. pylor. 5.

The length of the head is $3\frac{2}{3}$ in the total, the height of the body $3\frac{1}{3}$ only. Caudal fin very slightly emarginate. Brownish, reticulated with blue on the opercles; each scale with a light centre and a darker base and edge; a white spot above the lateral line, opposite to the front end of the anal fin, more or less visible in dried specimens; fins blackish, with darker edges.

Red Sea; Coasts of Coromandel and Malabar; Chinese and Javanese Seas.

a. Adult. China.
b. Adult: stuffed. China. Purchased of Mr. Warwick.
c. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
d. Half-grown. Amboyna. Purchased from Mr. Frank as *Mesoprion quadripunctatus.*
e. Adult: stuffed. Red Sea. From the Frankfort Museum.

14. Genyoroge cæruleopunctata.

Russell, i. p. 75. pl. 96.
Diacope cæruleopunctata, *Cuv. & Val.* ii. p. 424.
Mesoprion cæruleopunctatus, *Bleeker, Natuurk. Tydschr. Nederl. Indie*, 1851, p. 169.

D. $\frac{10}{15}$. A. $\frac{3}{8}$. L. lat. 45–50.

The height of the body is $2\frac{3}{4}$ or 3 in the total length, the length of the head $3\frac{1}{4}$ in the same; the diameter of the eye $3\frac{1}{2}$–$4\frac{1}{2}$ in the length of the head. Caudalis scarcely emarginate; the third, fourth and fifth dorsal spines longest; the second anal spine strongest and longest; the first ray of the ventrals rather elongate. Brownish red, with blue streaks on the forehead, the cheeks, and opercles; a black ring on the lateral line, below the front part of the soft dorsal fin; fins immaculate. (*Bl.*)

Coast of Coromandel; Sea of Padang (Sumatra).

15. Genyoroge melanura.

Diacope melanura, *Rüpp. N. W. Fische,* p. 92. t. 23. f. 1.

D. $\frac{10}{14}$. A. $\frac{3}{8-9}$. L. lat. 60. Cæc. pylor. 4.

The height of the body is $3\frac{1}{4}$ in the total length, and equal to the length of the head. Præoperculum serrated, with stronger denticulations below the notch. Upper profile of the head straight. Pectoral fins pointed, reaching nearly to the front end of the anal; caudalis notched. The third, fourth and fifth dorsal spines longest; the second of the anal fin longer and stronger than the third. Uniform crimson; dorsal, caudal, and anal fins white-edged; basal part of the caudal of black colour (disappearing in dried specimens).

Red Sea.

a. Adult: stuffed. Red Sea. From the Frankfort Museum.

16. Genyoroge amboinensis.

Mesoprion amboinensis, *Bleeker, Amb. & Cer.* p. 259.

D. $\frac{11}{13}$. A. $\frac{3}{8}$. L. lat. 55.

The height of the body is $3\frac{1}{4}$ in the total length, the length of the head $3\frac{1}{3}$–$3\frac{1}{4}$ in the same; the diameter of the eye is $3\frac{1}{2}$ in the length of the head. Caudalis slightly emarginate; the middle dorsal spines longest; the second anal spine longest, longer than the rays. Rose-coloured: back with oblique red streaks, sides with five or six yellow longitudinal stripes; fins yellow; a black blotch immediately above the lateral line.

Sea of Amboyna.

a, b. Half-grown. Amboyna. Purchased of Mr. Frank.

Bleeker (*l. c.*) describes the above species with eleven spines of the dorsal fin, and the following with ten; in subsequent memoirs he unites them, without explaining his reasons for it. If there is no mistake in the numbers given, both species must be different, as we have never found any variation in the number of the dorsal spines either in *Genyoroge* or in *Mesoprion*. Not having specimens of both the species, I am unable to decide the question, and give the diagnosis of *M. melanospilos*.

17. Genyoroge melanospilos.

Mesoprion melanospilos, *Bleeker, Celebes,* iii. p. 750.

D. $\frac{10}{14}$. A. $\frac{3}{8}$. L. lat. 60.

The height of the body is $3\frac{1}{2}$ in the total length, and equal to the length of the head; the diameter of the eye is $3\frac{1}{2}$ in the latter. Upper maxillary bone reaching to below the middle of the eye; the notch of the præoperculum very deep, and apparently bifid; the fifth spine of the dorsal fin and the second of the anal longest; caudalis notched. The black lateral blotch between the lateral line and the anterior dorsal rays; the spinous part of the dorsal fin black-edged; a black spot above the base of the pectoral fins. (*Bl.*)

Sea of Bulucomba (Celebes).

18. **Genyoroge fulva.**

Perca fulva, ***Forster, MSS.***
Holocentrus fulvus, ***Bl. Schn.*** p. 318.
Diacope fulva, *Cuv. & Val.* ii. p. 435.

D. $\frac{11}{14}$. A. $\frac{3}{8}$. L. lat. 50. L. transv. $\frac{7}{17}$.

The height of the body is equal to the length of the head, and $3\frac{1}{3}$ in the total; the diameter of the eye is $4\frac{1}{2}$ in the length of the head, and equal to two-thirds of the distance between the eye and the end of the muzzle; the upper maxillary bone reaches nearly to the level of the anterior margin of the eye; the præoperculum exhibits fine denticulations above the notch, coarser ones beneath. Caudalis very slightly concave behind. The fourth dorsal spine and the second of the anal fin longest and strongest; pectorals scarcely reaching the front end of the anal. Uniform yellowish red; caudalis white-edged.

Sea of Otaheiti.

a. Adult: bleached. Otaheiti. Old Collection.—Forster's original specimen.

19. **Genyoroge civis.**

Diacope civis, *Cuv. & Val.* vii. p. 444.

D. $\frac{11}{16}$. A. $\frac{3}{8}$.

The length of the head is one-third of the total, and equal to the height of the body. Uniform brownish red, with a brown spot on the soft parts of the dorsal and anal fins, and two brown streaks on the caudal. (*Val.*)

Seychelles.

37. MESOPRION*.

Mesoprion, *Cuv. Règne Anim.*; *Cuv. & Val.* ii. p. 439.
Diacope, sp., *Rüppell, Atlas,* p. 70.
Mesoprion, sp., *Bleeker.*

Seven branchiostegals. Teeth villiform, with canines in both jaws; teeth on the palatine bones. One dorsal, mostly with ten or eleven, rarely with nine or twelve spines, the anal fin with three. Operculum generally with two or three, rarely with one indistinct point; præoperculum with fine serrature, without or with a very open notch. Scales moderate.

All the seas of the Tropical regions.

* 1. Mesoprion aurolineatus, *Cuv. & Val.* iii. p. 496.—Ceylon.
2. Mesoprion richardi, *Cuv. & Val.* ii. p. 448.—Caribbean Sea.
3. Mesoprion tæniops, *Cuv. & Val.* vi. p. 543.—Celebes (rivers).
4. Mesoprion cyanopterus, *Cuv. & Val.* ii. p. 472.—Brazil.

Synopsis of the Species.

I. Præoperculum finely or moderately denticulated.

A. Coloration uniform, or with indistinct oblique and longitudinal *streaks.*

1. Ten dorsal spines.

a. Without a large black lateral blotch.

α. Caudal fin deeply forked.

1. M. microchir,
2. M. chrysurus.

β. Caudal fin truncated, or slightly notched.

aa. Ground-colour olive, with a yellow, green, or brown shade.

3. M. sparus,
4. M. dentatus,
5. M. carponotatus,
6. M. bohar,
7. M. caudalis,
8. M. bitæniatus,
9. M. waigiensis,
10. M. chrysotænia,
11. M. argentimaculatus,
12. M. lineatus,
13. M. gembra,
14. M. cynodon,
15. M. griseus,
16. M. buccanella,
17. M. aya.

bb. Ground-colour red.

18. M. borensis,
19. M. erythrinus,
20. M. rangus,
21. M. madras.

b. With a large black lateral blotch.

22. M. johnii,
23. M. fuscescens,
24. M. fulviflamma,
25. M. uninotatus,
26. M. mahogoni,
27. M. vivanus.

2. Eleven dorsal spines.

28. M. annularis,
29. M. malabaricus,
30. M. erythropterus,
31. M. lineolatus,
32. M. timoriensis,
33. M. isodon.

3. Twelve dorsal spines.

34. M. dodecacanthus,
35. M. dodecacanthoides,
36. M. aurorubens.

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5. Mesoprion pargus, *Cuv. & Val.* ii. p. 473.—Porto-Rico.
6. Mesoprion flavipinnis, *Cuv. & Val.* ii. p. 475.—Pondicherry.
7. Mesoprion rubellus, *Cuv. & Val.* ii. p. 475.—Pondicherry; Red Sea.
8. Sillaoo, *Russell*, pl. 100.—Mesoprion sillaoo, *Cuv. & Val.* ii. p. 476.—East Indies.
9. Mesoprion fulgens, *Cuv. & Val.* vi. p. 539.—Coast of Gorea.
10. Lutjanus lutjanus, *Bl.* t. 245.—Mesoprion lutjanus, *Cuv. & Val.* ii. p. 479. —East Indies.
11. Chirtah, *Russell*, i. pl. 93.—Mesoprion chirtah, *Cuv. & Val.* ii. p. 488.—Bay of Bengal.
12. Karooi, *Russell*, ii. pl. 125.—Mesoprion carui, *Cuv. & Val.* ii. p. 489; *Cantor*, *Catal.* p. 16.—Bay of Bengal.
13. Lutjanus albo-aureus, *Lacép.* iv. pl. 7. f. 1.—Mesoprion albo-aureus, *Cuv. & Val.* ii. p. 489.
14. Perca lunulata, *Mungo Park*, *Trans. Linn. Soc.* iii. p. 35. pl. 6.—Lutjanus lunulatus, *Bl. Schn.* p. 329; *Lacép.* iv. p. 213.—Mesoprion lunulatus, *Cuv. & Val.* ii. p. 477.—Sumatra.
15. Mesoprion olivaceus, *Cuv. & Val.* ii. p. 478.—Waigiou.
16. Mesoprion erythrognathus, *Cuv. & Val.* vii. p. 447.—Seychelles.
17. Mesoprion? emeryii, *Richards. Ic. Pisc.* p. 7. pl. 3. f. 2.—Australia.
18. Mesoprion elongatus, *Hombr. & Jacq. Voy. au Pôle Sud, Poiss.* p. 38. pl. 2. f. 3.—Hab. ——?
19. Mesoprion argenteus, *Hombr. & Jacq. l. c.* p. 39. pl. 2. f. 4.—Hab. ——?
20. Mesoprion caudanotatus, *Poey*, *Memor. Cuba*, 1851, p. 440. lam. 3. f. 3.—Cuba.

B. With a more or less broad, distinct, blackish lateral *band.*

37. M. vitta, 38. M. bleekeri, 39. M. enneacanthus.

C. With permanent blackish *cross-bands.*

40. M. semicinctus.

D. With several distinct longitudinal bands.

41. M. quinquelineatus, 42. M. sobra, 43. M. decussatus.

II. Species with anomalously armed præoperculum.

44. M. retrospinis, 45. M. pomacanthus.

I. Præoperculum moderately or finely denticulated.

A. Coloration uniform, or with indistinct oblique and longitudinal *streaks.*

1. Ten dorsal spines.

a. Without a large black lateral blotch.

a. Caudal fin deeply forked.

1. Mesoprion microchir.

Bleeker, Amboyna, iv. p. 332.

D. $\frac{10}{10-11}$. A. $\frac{3}{7-8}$. L. lat. 50.

The height of the body is $5\frac{1}{2}$ in the total length, the length of the head four times; the diameter of the eye is $3\frac{1}{2}$ in the latter; the upper profile of the head convex. The lower jaw rather prominent, the upper maxillary bone reaching to below the anterior half of the eye. Præoperculum not notched. Caudalis deeply forked; the dorsal spines slender, the middle ones nearly equal in length, higher than the rays; the third anal spine longest. Yellowish olive; the dorsal fin brown-spotted at the base, and above brown-edged, the other fins immaculate. (*Bl.*)

Sea of Amboyna.

2. Mesoprion chrysurus. Cuv.

Rabirubbia, *Parra*, pl. 22. f. 1.
Colas, *Duhamel, Pêches,* iv. cap. 5. p. 64. pl. 12. f. 1.
Acara pitamba, *Margr.* p. 155.
Sparus chrysurus, *Bl.* t. 262; *Lacép.* iv. p. 115.
Grammistes chrysurus, *Bl. Schn.* p. 187.
Anthias rabirubbia, *Bl. Schn.* p. 309.
Sparus semiluna, *Lacép.* iv. pp. 141, 142. pl. 3. f. 1.
Mesoprion chrysurus, *Cuv. & Val.* ii. p. 459; *Guichen. Poiss. in Ramon de la Sagra, Hist. Cuba,* p. 24.
—— aurovittatus, *Spix, Fische Brasil.* pl. 66.

D. $\frac{10}{13}$. A. $\frac{3}{9}$. L. lat. 55–60. L. transv. 9/18 Vert. 10/14.

The height of the body is equal to the length of the head, and one-fourth of the total. Caudalis deeply forked, with the upper lobe longest; pectorals reaching to the origin of the anal. Præoperculum very indistinctly emarginate; interoperculum without knob. Greenish olive, with oblique streaks above the lateral line, and some shining golden longitudinal bands on the sides. No lateral blotch, nor a spot in the axil.

Caribbean Sea; Coast of Brazil.

a. Fine specimen. West Indies. From the Haslar Collection.—Head above with small round violet spots.
b. Half-grown. Puerto Cabello. Purchased of Mr. Brandt.
c, d. Adult: skins. Jamaica. From Dr. Parnell's Collection.
e, f. Half-grown: skins. Jamaica. From Dr. Parnell's Collection.
g. Half-grown: skin. Jamaica. Purchased of Mr. Cuming.
h. Skin: not good state. Trinidad. Presented by J. B. Richardson, Esq.
i–n. Half-grown: skin. West Indies. Purchased of Mr. Scrivener.
o. Skeleton. From the Collection of the Zoological Society.
p. Half-grown. From the Haslar Collection.—Spotted like specimen *a*.

Skeleton.—The skeleton of this species deviates more from those of *M. uninotatus* and *griseus* than these species from each other. The maxillary bone gradually widens from the base to its extremity, and has the posterior margin nearly straight and the anterior concave. The posterior processes of the maxillary bones are of moderate length, about one-half the length of the bones themselves; each of these is armed in front with three canines, of nearly equal and of moderate size. There is a series of short conical teeth along all the outer margin, accompanied by a posterior villiform band. The mandibulary is furnished with an outer series of conical teeth, gradually becoming smaller in the posterior portion of the jaw; there are some villiform teeth besides, near the symphysis. The vomerine teeth are arranged in an anchor-shaped villiform band, occupying more than half the length of the bone. The palatine teeth form a band, five times as long as broad, and not extending on the pterygoid. The turbinal bones are well developed, elongate, and slightly divergent; they leave between them a triangular groove to receive the processes of the intermaxillary bones. A short triangular portion of the ethmoid is visible between the branches of the occipital crest, which in this species is rather elevated, to its anterior extremity, and extends along all the suture of the frontal bones. The lateral crests are relatively much less developed, and the interior arises from the middle of the space between the occipital crest and the upper margin of the orbit. The præorbital is large, irregularly quadrangular, and smooth; the remainder of the infraorbital bones are narrow, and form the base for a large concave plate reaching into the interior of the orbit.

The operculum has two obtuse points, with a notch between; a ridge on the interior surface of the operculum corresponds to the lower of the points; the sub- and interoperculum are entire. The limbs of the præoperculum have a rather oblique direction towards each other; the angle is rounded, and furnished with obtuse denticulations. The posterior limb has an exceedingly fine serrature, extending into the notch, which is scarcely conspicuous. The inferior limb is entire. Suprascapula scarcely denticulated. The glossohyal is oblong, of nearly equal width posteriorly and anteriorly, and covered with exceedingly fine villiform teeth ; the urohyal terminates posteriorly in two points, the lower of which is elongate ; there is a semicircular notch between. The basal portion of the skull is slightly swollen, and there is a deep and broad longitudinal groove behind the condyle of the basioccipital.

There are ten abdominal and fourteen caudal vertebræ, the length of the former portion of the column being to that of the caudal as 1 : 1·55. The first interhæmal spine is not strong, and equal to the length of the first six vertebræ together ; it is attached to the hæmal spines of the eleventh and twelfth vertebræ.

β. Caudal fin truncated, or slightly notched.

aa. Ground-colour olive, with a yellow, green, or brown shade.

3. Mesoprion sparus.

Diacope sparus, *Temm. & Schleg. Faun. Japon. Poiss.* p. 14.

D. $\frac{10}{10}$. A. $\frac{3}{8}$.

Physiognomy sparoid. The upper maxillary bone reaching to below the middle of the eye. Præoperculum with exceedingly fine denticulations, and a slight notch behind ; suprascapula denticulated. Caudalis notched ; the second anal spine shorter, but stronger, than the third. Uniform brownish. (*Schleg.*)

Sea of Japan.

4. Mesoprion dentatus.

Apsilus dentatus, *Guichen. in Ramon de la Sagra, Hist. Cuba, Poiss.* p. 29. pl. 1. f. 2.

D. $\frac{10}{10}$. A. $\frac{3}{8}$. L. lat. 60. L. transv. 10/18

The upper maxillary reaches scarcely beyond the anterior margin of the eye. Præoperculum with a very slight notch, with the posterior limb exceedingly finely serrated, and with conspicuous denticulations beneath. Dorsalis nearly even, caudalis forked ; the second anal spine shorter, but not stronger, than the third. Coloration uniform.

Jamaica.

a, b. Adult : skins. Jamaica. From Dr. Parnell's Collection.
c. Half-grown : skin. Jamaica. From Dr. Parnell's Collection.

Description.—This species is very remarkable for its being an intermediate form between species of *Centropristis*, *Anthias*, and *Mesoprion*. I place it in the latter genus on account of the præopercular notch, which, slight as it is, nevertheless is present, and followed by more conspicuous denticulations of the angle. Otherwise this species has much similarity to *Centropristis atrarius*, *Anthias macrophthalmus*, and *Mesoprion aurorubens* in general habit, and in the small number of the rays of the vertical fins. The preceding species, *Mesoprion sparus,* appears to be closely allied to the fish of the present description; and it is a very remarkable fact in the geographical distribution of fishes, that we find several species, described by Schlegel in the 'Fauna Japonica,' represented in the Atlantic by others, not or scarcely different,—viz., among the Serranina, *Anthias oculatus, Serranus tsirimenara* and *margaritiferus, Mesoprion sparus* and *dentatus.*

The height of the body is $3\frac{1}{3}$ or $3\frac{1}{2}$ in the total length, the length of the head four times. The eye is situated in the middle of the length of the head, in which its diameter is contained $4\frac{1}{3}$; the interspace between the eyes equals the diameter. The snout is $1\frac{1}{2}$ as long as the eye is wide; the cleft of the mouth moderate, slightly oblique, with the lower jaw rather prominent. The upper maxillary reaches to, or slightly beyond the vertical from the anterior margin of the orbit. The front head. the snout, and the præorbital are completely scaleless.

The præoperculum has a naked margin, broadest at the angle; the remainder is scaly, there being seven rows of scales between the eye and the lower limb of the præoperculum. The posterior limb is slightly curved, and furnished with an exceedingly fine serrature; there is a very slight notch immediately above the angle; the angle and the lower limb form one curvature, with distinct denticulations. The operculum is nearly twice as high as wide, with the base naked, as in many fishes; it is covered with seven oblique rows of scales. and terminates posteriorly in two obtuse points with a notch between. The suboperculum has two or three rows of scales, one of which extends over all its length. The interoperculum is elongate, crescent-shaped, with two series of small scales.

The origin of the dorsal fin corresponds to the 6th scale of the lateral line, the end to the 39th, the origin of the soft portion to the 26th:—consequently the base of the spinous is much longer than that of the soft. The upper margin is slightly undulating, the fourth and fifth spines and the fifth ray being equal in length, and $2\frac{1}{2}$ in the total; the last dorsal spine is one-fourth shorter. All the spines are slender and equal in strength. The dorsal fin is entirely scaleless. The caudal fin is moderately forked, the middle ray being half the length of the longest; small scales cover about one-half of the fin. The origin of the anal fin corresponds to the vertical from the 28th scale of the lateral fin, the end to that from the 41st. The spines are feeble; the first is one-half the length of the second, the second two-thirds the length of the third; the third is three-quarters the length of the first ray, which equals the ninth dorsal spine; the last ray is slightly elongate and prominent beyond the margin of the fin. The pectoral fin is elongate, pointed, and extends backwards to the first or second ray of the anal fin; a short triangular patch at the base is scaly. The ventral fin is similar and extends to the vent.

The lateral line follows the outline of the back, and is formed by scales rather smaller than the others.

The lateral series of teeth in the jaws contain larger ones than those of the villiform bands, and there are two or three canines of moderate size on each side, above and beneath. The vomerine teeth form a triangular patch, with an anterior obtuse angle. The palatine band is cuneiform, narrow

The coloration is now uniform greyish, the scales of the back having a darker margin; the dorsal, anal, and ventral fins blackish.

	inches.	lines.
Total length	13	9
Height of the body	3	10
Length of the head	3	5
Diameter of the eye	0	$9\frac{1}{2}$
Length of the fourth dorsal spine	1	$6\frac{1}{2}$
——— of the tenth dorsal spine	1	$0\frac{2}{3}$
——— of the first dorsal ray	1	3
——— of the tenth dorsal ray	1	$4\frac{1}{2}$
——— of the third anal spine	1	$0\frac{1}{2}$
——— of the first anal ray	1	3
——— of the eighth anal ray	1	3
——— of the pectoral fin	3	5
——— of the ventral fin	2	8

5. Mesoprion carponotatus.

Richardson, Ann. & Mag. Nat. Hist. 1842, vol. ix. p. 28.

D. $\frac{10}{15}$. A. $\frac{3}{10}$. L. lat. 68.

External appearance sparoid. The length of the head is $3\frac{2}{3}$ in the total length, and equal to the height of the body; the diameter of the eye is $4\frac{1}{3}$ in the length of the head. Præoperculum with a few scarcely visible denticulations, slightly emarginate; operculum rounded, as in *Sparus*, with a shallow re-entering arc; suprascapula entire. Caudalis truncated: the point of the pectoral fin falls short of the anus. The fourth dorsal spine longest, the second and third of the anal fin nearly equal. Coloration uniform, with a black spot at the root of the pectoral fin.

North Australian Coast.

a. Adult. Port Essington. From Mr. Gilbert's Collection.

6. Mesoprion bohar.

Sciæna bohar, *Forsk.* p. 46.
Sparus lepisurus, *Lacép.* iii. pl. 15. f. 2.
Lutjanus bohar, *Bl. Schn.* p. 325.
Diacope bohar, *Cuv. & Val.* ii. p. 433; *Rüpp. Atl. Fische*, p. 73, and *N. W. Fische*, p. 103.
Diacope quadriguttata, *Cuv. & Val.* ii. p. 427, vi. p. 533.

D. $\frac{10}{14}$. A. $\frac{3}{9}$. Vert. 10/14.

The height of the body is $3\frac{3}{4}$ in the total length, the length of the head $3\frac{1}{4}$. Interoperculum with a distinct knob, præoperculum slightly notched. Caudalis notched; pectorals not fully reaching to the anal. Brownish; in immature specimens two whitish blotches on each side of the back, disappearing after death.

From the Red Sea along the eastern coast of Africa; (East Indies).

Diacope quadriguttata, Cuv., after having been united by Rüppell with *Diac. bohar*, and acknowledged by Valenciennes as the young animal of the latter, is now again separated by Bleeker (*Natuurk. Tydschr. Nederl. Indie*, ii. p. 233). The descriptions of *D. bohar* are not sufficient to enable us to decide, without specimens from the Red Sea and the East Indies, whether there are really two different species or not. Bleeker, in his description, mentions the præoperculum as being deeply notched.

a. Half-grown: not good state. Madagascar. Presented by Dr. J. E. Gray.

7. **Mesoprion caudalis.**

Cuv. & Val. vi. p. 537.

D. $\frac{10}{13}$. A. $\frac{3}{7}$.

Caudalis slightly rounded; præoperculum with a very conspicuous notch, and stronger denticulations beneath. Yellowish olive, with violet longitudinal streaks above and beneath the lateral line; caudal fin with a large, triangular, violet, yellowish-edged blotch; the spinous part of the dorsal fin blackish; the other fins yellowish. (*Val.*)

Vanicolo Islands.

8. **Mesoprion bitæniatus.**

Diacope bitæniata, *Cuv. & Val.* vi. p. 536; *Quoy & Gaim. Voy. Astrol. Poiss.* p. 664. pl. 5. f. 2.

D. $\frac{10}{12}$. A. $\frac{3}{7}$.

Caudalis slightly emarginate. Yellowish, with oblique streaks above the lateral line, and longitudinal beneath; two red bands across the cheek, and a black one across the middle of the caudal fin.

Celebes.

9. **Mesoprion waigiensis.**

Diacope waigiensis, *Quoy & Gaim. Voy. Freyc. Zool.* p. 307.
—— immaculata, *Cuv. & Val.* ii. p. 430 *.

D. $\frac{10}{14}$. A. $\frac{3}{9}$. L. lat. 75.

The height of the body is $3\frac{2}{3}$ in the total length, and equal to the length of the head; the diameter of the eye is $4\frac{2}{3}$ in the latter. Præoperculum very finely serrated; notch conspicuous, knob rather indistinct. Caudalis emarginate; pectoral distant from anal fin; the third and fourth dorsal spines longest; the second of the anal stronger, but not longer, than the third. Uniform olive (in a dried state), with indistinct oblique streaks above the lateral line, and longitudinal ones beneath; base of the pectoral with a narrow black spot.

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* Cuvier quotes this species as *Diacope immaculata*, Quoy & Gaim.; but this name was given by himself, instead of the true denomination mentioned above.

Sea of Waigiou; Port Essington.

a. Adult: stuffed. Port Essington.

There is a tooth near the symphysis of the intermaxillary bones, stronger than those of the velvet-like band; then, more at the side, but in front of the muzzle, a very strong and long canine; then a series of nine or ten smaller ones, gradually becoming smaller behind; at the inside of these canines is the band of velvet-like teeth. In the exterior series of the lower jaw are four canines in front and at the side; and then follow two larger ones, but smaller than the fang of the upper jaw.

10. Mesoprion chrysotænia.

Bleeker, Natuurk. Tydschr. Nederl. Indie, ii. 1851, p. 170, and *Act. Soc. Sc. Indo-Nederl.* i. p. 40.

D. $\frac{10}{15}$. A. $\frac{3}{9}$. L. lat. 65.

The height of the body is $3\frac{1}{4}$ in the total length, the length of the head $3\frac{2}{5}$; the diameter of the eye is one-fourth of the latter; the upper profile of the head straight-lined. Suprascapula and præoperculum serrated, the latter with a conspicuous notch behind. Caudalis emarginate; the third and fourth dorsal spines longest. Bluish green (in life), with seven or eight shining golden, broad, longitudinal bands; a black spot above the base of the pectoral fins; fins immaculate.

Sea of Batavia.

a. Half-grown. From the Haslar Collection.

11. Mesoprion argentimaculatus.

Sciæna argentimaculata, *Forsk.* p. 50.
Perca argentata, *Bl. Schn.* p. 86.
Labrus argentatus, *Lacép.* pp. 426, 467.
Diacope argentimaculata, *Cuv. & Val.* ii. p. 432; *Rüpp. Atlas Fische*, p. 71. t. 19. f. 1.

D. $\frac{10}{13}$. A. $\frac{3}{8}$. Cæc. pylor. 4.

The height of the body is $3\frac{2}{3}$ in the total length, and equal to the length of the head. The upper maxillary bone reaching to the level of the posterior margin of the eye; a slight notch of the præoperculum always conspicuous; knob of the interoperculum sometimes wanting; fine denticulations above the notch, coarser ones beneath. Caudalis truncated, pectorals not fully reaching to the anal. Greenish; each scale lighter at the edge, sometimes white. (*Rüpp.*)

Red Sea.

12. Mesoprion lineatus.

Diacope lineata, *Quoy & Gaim. Voy. Freyc. Zool.* p. 309.
—— striata, *Cuv. & Val.* ii. p. 430.
Mesoprion striatus, *Bleek. Perc.* p. 44.
—— janthinuropterus, *Bleek. Celebes,* iii. p. 751.

D. $\frac{10}{13}$. A. $\frac{3}{8}$. L. lat. 50.

The height of the body is $3\frac{1}{2}$ in the total length, and equal to the length of the head; the diameter of the eye is one-fifth of the latter; the notch of the præoperculum is very slight. Caudalis emarginate, the fourth and fifth dorsal spines longest. Olive, with oblique red-brown streaks above the lateral line, and with longitudinal lines of the same colour on the opercles and sides of the body; no lateral blotch; dorsal and caudal fins blackish, the spinous part of the former with a black edge; pectorals yellow; anal and ventral fins rose-coloured.

Waigiou; Molucca Sea; Sea of Java.

13. Mesoprion gembra.

Russell, pl. 95.
Alphestes sambra, *Bl. Schn. Syst. Posth.* p. 236. t. 51.
Mesoprion yapilli, *Cuv. & Val.* ii. p. 483.
—— gembra, *Cuv. & Val.* ii. p. 485; *Cantor, Catal.* p. 15.
—— immaculatus, *Cuv. & Val.* ii. p. 474; *Bleek. Perc.* p. 45.
—— gembra, *Bleek. Sumatra,* ii. p. 246 (young).

D. $\frac{10}{13-14}$. A. $\frac{3}{8}$. L. lat. 46.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $3\frac{1}{3}$; the diameter of the eye is $4\frac{1}{3}$ in the latter. The upper profile of the head is slightly concave; the jaws are equal in front, the upper maxillary bone reaching to below the anterior half of the eye. Suprascapula and præoperculum finely serrated, the latter slightly emarginate. Caudalis truncated, pectorals distant from the anal; the third, fourth, and fifth dorsal spines longest; the second of the anal fin not much longer, but stronger, than the third. Uniform dark olive, each scale with a brown base; dorsal, anal, and ventral fins olive, along the middle lighter, the former with a black edge as far as the spinous part; young specimens with nine or ten darker cross-bands.

Bay of Bengal; Molucca Sea.

a. Large specimen: bleached. India. Old Collection.
b. Large specimen: stuffed.
c. Adult. Sumatra. From Mr. Frank's Collection.
d–g. Half-grown. Amboyna; Borneo. From Mr. Frank's Collection.
h. Half-grown. Amboyna. From Mr. Frank's Collection.
i. Adult. Amboyna. From Mr. Frank's Collection.
k. Half-grown: stuffed.
l. Young.

Sir John Richardson mentions a dried specimen of this fish, in the Collection of the British Museum, procured by Mr. Gilbert at Port Essington (No. 21), and he describes it under the name of *M. yapilli*, in the *Ann. & Mag. Nat. Hist.* 1842, p. 26. I am not able to find this fish in the Collection.

14. **Mesoprion cynodon.**

Caballerote, *Jocu, Parra*, pl. 25. f. 1, 2.
Anthias caballerote, *Bl. Schn.* p. 310.
—— jocu, *Bl. Schn.* p. 310.
Mesoprion cynodon, *Cuv. & Val.* ii. p. 465.
—— analis, *Cuv. & Val.* ii. p. 452 (not *Castelnau, Anim. nouv. ou rares de l'Amér. du Sud, Poiss.* p. 4).
—— litura, *Cuv. & Val.* ii. p. 467.

D. $\frac{10}{14}$. A. $\frac{3}{8}$. L. lat. 43–46. L. transv. 9/16.

The height of the body is 3 to $3\frac{1}{5}$ in the total length, the length of the head $3\frac{2}{5}$; the diameter of the eye is $4\frac{1}{2}$ in the latter, and $1\frac{2}{3}$ in the length of the snout; jaws equal in front. Præoperculum with a distinct notch, but the knob of the interoperculum very inconspicuous; suprascapula serrated. Caudalis slightly emarginate; pectorals scarcely reaching to the origin of the anal; the fourth dorsal spine longest. Olive (in spirits), each scale with a darker base; a bluish-white, darker-edged streak from the præorbital below the eye across the opercles. Canines large.

Atlantic Coasts of Tropical America.

a. Adult. South America. Presented by Sir R. Schomburgk.
b, c. Adult: not good state. South America. Purchased of Mr. Brandt.
d. Half-grown: very bad state. West Indies.
e. Adult: skin. Jamaica. From Dr. Parnell's Collection.
f. Adult. From the Haslar Collection.
g. Young. St. Domingo. Purchased of Mr. Cuming.

This species may be readily distinguished from the following by its smaller scales; there are nine or even ten longitudinal series of scales between the lateral line and the dorsal fin, whilst *M. griseus* has six or seven only. The other characters are less conspicuous in young and half-grown individuals,—viz., the greater height of the body in *M. cynodon*, and the greater length of the snout in *M. griseus*. From Cuvier's description alone it would be impossible to determine the species, as the greater part of the species of *Mesoprion*, as in many other genera, are either insufficiently described, or form nominal species only, founded on the most trivial characters.

15. **Mesoprion griseus.**

Mesoprion griseus, *Cuv. & Val.* ii. p. 469; ? *Guichen. in Ramon de la Sagra, Hist. Cuba, Poiss.* p. 26.
—— flavescens, *Cuv. & Val.* ii. p. 472.

Mesoprion linea, *Cuv. & Val.* ii. p. 468.
—— jocu, *Cuv. & Val.* ii. p. 466.
—— goreensis, *Cuv. & Val.* vi. p. 540.

D. $\frac{10}{14\ (15)}$. A. $\frac{3}{8}$. L. lat. 40–45. L. transv. $\frac{6\text{–}7}{15}$. Vert. 10/14.

The height of the body is $3\frac{1}{3}$ to $3\frac{3}{4}$ in the total length, and equal to the length of the head; the diameter of the eye is about $4\frac{1}{2}$ in the latter, and (in adult specimens) one-half the length of the snout; jaws equal. Præoperculum very slightly emarginate at its posterior limb, interoperculum without knob. Caudalis slightly emarginate; pectorals not reaching to the origin of the anal; canines very large. Olive (in spirits), each scale with a darker base; a bluish-white, darker-edged line from the præorbital below the eye across the opercles; the line is sometimes interrupted, forming a series of small spots, sometimes not visible. Young and half-grown specimens often with alternating lighter and darker cross-bars, or with the dorsal and caudal fins black-edged, and the former with a series of irregular dark spots.

Atlantic Coasts of Tropical America; West Coast of Africa.

a. Large specimen. West Indies. Purchased of Mr. Frank.
b–d. Half-grown. West Indies.
e. Half-grown. West Indies. Purchased of Mr. Brandt.
f–h. Half-grown. West Indies.
i, k. Adult: stuffed. West Indies. Purchased of Mr. Scrivener.
l. Half-grown: stuffed. West Indies. Purchased of Mr. Scrivener.
m. Fine specimen. Cuba. From the Collection of the Zoological Society.
n. Adult: skeleton. Cuba. From the Collection of the Zoological Society.
o. Adult: stuffed. Cuba. From the Collection of the Zoological Society.
p–t. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.
u. Half-grown: skin. Jamaica. Purchased of Mr. Cuming.
v. Adult. South America. Presented by Sir R. Schomburgk.
w. Half-grown. British Guiana. Presented by Sir R. Schomburgk.
x, y. Adult: not good state. Puerto Cabello. Purchased of Mr. Brandt.
z. Adult. From the Haslar Collection.
α, β. Adult: stuffed.

In specimens which have not attained to maturity, the soft portion of the dorsal and anal fins is more elevated. I give the description of specimen *w*.

Description of the specimen.—The body is compressed and rather short, the distance between the dorsal and caudal fins being $2\frac{1}{2}$ in the length of the head. The head is compressed; the interspace between the eyes not broader than the vertical diameter of the eye. The cleft of the mouth is nearly horizontal, and rather wide; the upper maxillary reaches somewhat beyond the vertical, from the anterior margin of the eye. The cheek is scaly; there are seven rows of scales between the eye and the lower limb of the præoperculum, the row nearest the eye being formed by very large scales, as in most of these fishes. The posterior limb of the præoperculum is exceedingly finely serrated, and has a slight notch above the angle; the denticulations of the angle are stronger. The operculum is triangular, its width being 1⅓ in its height; it has posteriorly two short and very obtuse lobes, separated from each other by a notch; the lower is the more prominent.

The base of the vertical fins is covered with small scales. The origin of the dorsal fin corresponds to the vertical from the 4th scale of the lateral line, the end to that of the 35th, the origin of the soft portion to that of the 22nd. The upper margins of both portions are convex, separated by a notch. The spines are of moderate strength, and, as in many other *Acanthopterygii*, alternately stronger and more feeble*; the fourth is the longest, 2½ in the length of the head; the last spine is much shorter than the first ray. Among the rays, the eighth and ninth are longest—rather longer than one-half the length of the head. The caudalis is slightly emarginate. The anal spines are moderately strong; the second is rather longer, but not stronger than the third; the soft portion is much more elevated, and has a rounded margin, the fourth ray being longest, and equal in height to the ninth dorsal ray; the origin of the fin corresponds to the vertical from the 25th scale of the lateral line, the end to that from the 33rd. The pectoral and ventral fins are equal in length, the former extending backwards to the vent only, the latter nearly to the origin of the anal.

The scales are of moderate size; one of the largest, taken from the side, below the lateral line, covers nearly one-half the eye.

In both jaws there are larger teeth in the external row of the villiform bands; the upper jaw is armed with one pair of canines, of moderate size; no canines in the lower jaw. The vomerine teeth form a broad triangular patch, with a produced anterior angle. The palatine teeth in cuneiform bands.

	inches.	lines.
Total length	5	5
Height of the body	1	8
Length of the head	1	8
Diameter of the eye	0	4½
Length of the fourth dorsal spine	0	7½
——— of the ninth dorsal ray	0	10
——— of the second anal spine	0	6½
——— of the fourth anal ray	0	10
——— of the pectoral	1	1

There are four other specimens in the Collection of the British

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* In fact, the spines are always equally strong, each being on one side broader and on the other narrower; so that, if viewed from the left side, the third, fifth, seventh, &c., appear to be broadest; if viewed from the right, the fourth, sixth, eighth, &c.

Museum, from the west coast of Africa; they represent one or two nominal species of Valenciennes (*M. gorensis*, and probably *M. fulgens*); the females have a considerably more elevated body than the males.

γ, δ. Adult: male. River Niger. From Mr. Fraser's Collection.
ε. Adult: female. River Niger. From Mr. Fraser's Collection.
ζ. Adult: female. Coast of Africa. From the Haslar Collection.
η. Half-grown. Fernando Po. From Mr. Fraser's Collection.

Skeleton.—The maxillary bone gradually widens from the base to its extremity, and has the posterior margin convex and the anterior concave. The posterior processes of the intermaxillary bones are of moderate length, about two-thirds the length of the bones themselves; these are armed with a pair of very strong canines, between which are two other pairs of smaller ones; there is a series of short conical teeth along all the outer margin; the remainder of the teeth form a villiform band. The mandibulary is furnished with an outer series of conical teeth; those standing in front of the jaw and in the middle of the side of the dentary are the largest and canine-like; the villiform band of mandibulary teeth does not extend on the lateral portion of the dentary. The vomerine teeth are arranged in an anchor-shaped villiform band, which extends backwards to the middle of the bone. The palatine teeth form a broad band, three times as long as broad, which does not extend on the pterygoid. The turbinal bones are strong, elongate, and being very divergent, they leave between them a triangular groove, to receive the processes of the intermaxillaries. The anterior portions of the frontal bones also diverge, and leave between them a space, filled up by an elongate portion of the ethmoid, which in this and other species of *Mesoprion forms part of the upper surface of the skull.* The space between the orbits is rather narrow and flat, with some grooves and openings of the rudimentary system of muciferous channels. The portion of the upper surface of the skull, behind the orbits, is distinguished by high crests, leaving between them very deep longitudinal grooves. The median crest is that of the supraoccipital bone, which, strong, but moderately elevated, slightly bifurcates in front, and extends on the frontal bones to above the middle of the orbit. Two other crests arise from the orbit, the inner of which runs (nearly parallel with that of the occipital bone) to the articulation of the superior piece of the suprascapula; the outer crest descends downwards in a slight curve, and terminates at the junction of the suprascapula, operculum, and præoperculum. The groove between the two outer crests is triangular, and a large opening leads into the occipital region. The præorbital is large, irregularly quadrangular, and smooth; the remainder of the infraorbital bones are narrow, and form the base for a large concave plate reaching into the interior of the orbit.

The operculum has neither spine nor notch; the sub- and interoperculum entire. The limbs of the præoperculum have a very oblique direction towards each other; the angle is rounded, and armed with strong spinous teeth; the posterior limb is minutely serrated in all its length and in the open notch above the angle; the inferior limb is entire. Suprascapula obtusely denticulated. The glossohyal is oblong, and covered with fine villiform teeth; the urohyal terminates posteriorly in two elongate points, with a semicircular notch between.

There are ten abdominal and fourteen caudal vertebræ, the length of the former portion of the column being to that of the caudal as 1 : 1·4. The first interhæmal spine is strong, dagger-shaped, with a longitudinal groove on each side, and equal to the length of the second vertebra to the eighth.

16. Mesoprion buccanella.

Mesoprion buccanella, *Cuv. & Val.* ii. p. 455; *Guichen. in Ramon de la Sagra, Hist. Cuba, Poiss.* p. 23.

D. $\frac{10}{14}$. A. $\frac{3}{8}$. L. lat. 54. L. transv. 8/17.

The height of the body is $3\frac{1}{3}$ in the total length, and nearly equal to the length of the head; the diameter of the eye is one-fourth of the latter, and $1\frac{1}{2}$ in the length of the snout; the upper profile of the head oblique, straight, the lower nearly horizontal. Suprascapula and præoperculum serrated, the latter with a slight notch; knob of interoperculum flat, conspicuous. Caudalis emarginate, pectorals just reaching the anal. The fourth and fifth dorsal spines longest; the second and third of the anal fin nearly equal in length. Uniform yellowish olive (in a dried state), with indistinct oblique streaks above the lateral line, and with longitudinal ones beneath; base of the pectoral deep black.

Caribbean Sea.

a. Fine specimen. Cuba. From the Collection of the Zoological Society.
b–e. Adult: skins. Jamaica. From Dr. Parnell's Collection.
f, *g*. Adult: stuffed. West Indies. From Mr. Scrivener's Collection.
h. Half-grown: stuffed. West Indies. From Mr. Scrivener's Collection.
i. Adult: stuffed. America.

17. Mesoprion aya.

Acaraaya, *Margrave*, pp. 167, 168.
Bodianus aya, *Bl.* t. 227; *Lacép.* iv. pp. 286, 287.
—— ruber, *Bl. Schn.* p. 330.
Mesoprion aya, *Cuv. & Val.* ii. p. 457; *Guichen. in Ramon de la Sagra, Hist. Cuba, Poiss.* p. 24.

D. $\frac{10}{14}$. A. $\frac{3}{8}$. L. lat. 65. L. transv. 10/22.

The length of the head is nearly equal to the height of the body, and $3\frac{3}{5}$ in the total; the diameter of the eye is $4\frac{1}{2}$ or $4\frac{3}{4}$ in the length of the head, and $1\frac{3}{5}$ in that of the snout. Jaws equal in front; the upper maxillary reaches slightly beyond the vertical from the front margin of the orbit. Præoperculum with a distinct notch, interoperculum with a slight and flat knob. The fourth and fifth dorsal spines longest, longer than the soft rays. Caudalis slightly emarginate; pectoral fin extending to the origin of the anal fin. Coloration uniform, without black blotch; caudalis with a narrow black margin.

Caribbean Sea.

a, b. Adult: skins. Jamaica. From Dr. Parnell's Collection.
c. Half-grown: skin. Jamaica. From Dr. Parnell's Collection.
d. Fine specimen. South America. Presented by Sir R. Schomburgk.

bb. Ground-colour red.

18. **Mesoprion borensis.**

Diacope borensis, *Cuv. & Val.* ii. p. 436 (not *Richards.*).
—— tiea, *Less. Voy. Dup.* p. 231. pl. 23 (opercles bad).

D. $\frac{10}{14}$. A. $\frac{3}{9}$.

The height of the body is $2\frac{3}{4}$ in the total length, the length of the head $3\frac{1}{3}$; the upper profile of the snout very slightly concave. Notch of præoperculum and knob of interoperculum very conspicuous. Caudalis slightly notched; pectorals reaching to the front end of the anal. Red: the dorsal and caudal fins with a violet shade. (*Less.*)

Island of Borabora.

This species belongs perhaps to the genus *Genyoroge*; according to the figure quoted, the third anal spine is much longer than the second.

19. **Mesoprion erythrinus.**

Diacope erythrina, *Rüpp. N. W. Fische*, p. 92. t. 23. f. 3.

D. $\frac{10}{14}$. A. $\frac{3}{9}$.

The height of the body is one-third of the total length, the length of the head one-fourth; the outline of the forehead gibbous, prominent above that of the snout. Præoperculum with a very slight notch, interoperculum without knob. Lower jaw longest. Caudalis truncated, pectoral not quite reaching to the anal fin. Uniform red. (*Rüpp.*)

According to the figure given by Dr. Rüppell, this species would be easily distinguished by the very small size of the eye, its diameter being about one-seventh of the length of the head; but this is not mentioned in the description.

Red Sea.

20. **Mesoprion rangus.**

Rangoo, *Russell*, pl. 94.
Mesoprion rangus, *Cuv. & Val.* ii. p. 482; *Cantor, Catal.* p. 14.

D. $\frac{10}{13-15}$. A. $\frac{3}{8}$.

The height of the body is $3\frac{1}{2}$ in the total length, and equal to the

length of the head. Præoperculum serrated, slightly emarginate, and with stronger denticulations at the angle. Caudalis truncated. Uniform cherry-red.

Seas of Java and Ceylon ; Coast of Coromandel ; Malayan Peninsula.

a. Skin, twenty inches long. Ceylon. Collected by E. F. Kelaart, M.D.

21. Mesoprion madras.

Cuv. & Val. vii. p. 446 ; *Bleeker, Perc.* p. 44.

D. $\frac{10}{13}$. A. $\frac{3}{8}$. L. lat. 55.

The height of the body is $3\frac{3}{4}$ in the total length, the length of the head $3\frac{1}{6}$; the diameter of the eye is $3\frac{1}{2}$ in the latter. Præoperculum serrated, not notched. Caudalis truncated, the fourth dorsal spine longest, all being slender. Reddish, with reddish-brown longitudinal streaks ; fins yellow. (*Bl.*)

Seychelles ; Batavia.

b. With a large black lateral blotch.

22. Mesoprion johnii.

Renard, Poiss. i. t. 31. f. 172 ; *Russell,* t. 97.
Anthias johnii, *Bloch,* t. 318.
Sparus tranquebaricus, *Shaw, Zool.* iv. p. 471.
? Coius catus, *Buch. Ham. Gang. Fish.* p. 90. pl. 38. f. 30.
Mesoprion unimaculatus, *Quoy & Gaim. Zool. Freyc.* p. 304 ; *Cuv. & Val.* ii. p. 441 ; *Bleeker, Perc.* p. 42 ; *Richards. Ichth. China,* p. 229 ; *Quoy & Gaim. Voy. de l'Astrol. Poiss.* p. 665. pl. 5. f. 3.
—— johnii, *Cuv. & Val.* ii. p. 443 ; *Cantor, Catal.* p. 13.

D. $\frac{10}{14}$. A. $\frac{3}{8}$. L. lat. 48.

The height of the body is $3\frac{1}{2}$ in the total length, and nearly equal to the length of the head. Notch of præoperculum and knob of interoperculum conspicuous ; præoperculum with finer denticulations above, and with coarser ones beneath the notch ; the upper maxillary bone reaching to below the anterior half of the eye. Caudalis slightly emarginate, pectorals not reaching to the front end of the anal fin ; the third, fourth and fifth dorsal spines longest ; the second of the anal stronger than the third, but nearly equal in length. Yellowish olive (in a dried state), with indistinct oblique streaks above the lateral line and longitudinal ones beneath ; a large oval black spot on the lateral line, extending over the scales of about the 23rd–28th transverse lines.

Indian Ocean ; China Sea ; Malay Archipelago ; Coast of Australia ; Pacific.

a. Half-grown : not good state. From the Haslar Collection.
b. Half-grown, Old Collection.
c, d. Young. From the Collection of the Zoological Society.
e. Adult : stuffed : not good state. Sine patria. Old Collection.

f. Half-grown: skin: not good state. Port Essington. Presented by the Earl of Derby.
g. Young: not good state. N.W. Australia. Presented by Sir Richardson.
h. Half-grown: stuffed. Pacific. Voyage of the Rattlesnake.
i. Half-grown: skin. China. From Mr. Warwick's Collection.
k, l. Adult. China.
m–o. Young. Madras. Presented by J. C. Jerdon, Esq.
p. Young. Macassar. From Mr. Frank's Collection.
q. Half-grown: stuffed. Cape Sea. Presented by Sir A. Smith.
r. Adult: stuffed.

23. Mesoprion fuscescens.

Mesoprion fuscescens, *Cuv. & Val.* vi. p. 538; *Bleeker, Batjan,* ii. p. 197.
—— hoteen, *Richards. Ichthyol. China,* p. 229.

D. $\frac{10}{13}$. A. $\frac{3}{8}$. L. lat. 50.

The height of the body is $3\frac{1}{2}$ in the total length, and equal to the length of the head; the diameter of the eye is $4\frac{1}{2}$ in the latter; the upper profile of the head is straight, of the neck slightly concave. Jaws nearly equal, the upper maxillary bone reaching to below the anterior half of the eye. Præoperculum serrated, with a conspicuous notch behind and with stronger denticulations beneath. Caudalis emarginate; the fifth dorsal spine longest; the second and third anal spines nearly equal in length. Olive, each scale darker at the base: a large black blotch on the lateral line, below the middle of the soft dorsal fin; pectorals with a brownish spot at the base.

Fresh waters of Celebes and Batjan.

I refer to this species both the specimens upon which Dr. Richardson founded the species *M. hoteen,* as all the details of Bleeker's description of *M. fuscescens* may be applied to them.

a. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
b. Half-grown: stuffed. China. Presented by J. R. Reeves, Esq.

24. Mesoprion fulviflamma.

Sciæna fulviflamma, *Forsk.* p. 45.
Perca fulviflamma, *Bl. Schneid.* p. 28.
Centropomus hober, *Lacép.* iv. p. 255.
Diacope flulviflamma, *Cuv. Règne Anim.*; *Rüpp. Atl. Fische,* p. 72. t. 19. f. 2, and *N. W. Fische,* p. 94; *Cuv. & Val.* ii. p. 423.
Mesoprion monostigma, *Cuv. & Val.* ii. p. 446 (not *Bleek.*).
—— fulviflamma, *Bleek. Amb.* ii. p. 553.

D. $\frac{10}{13}$. A. $\frac{3}{8}$. L. lat. 50. Cæc. pylor. 5.

The height of the body is $3\frac{2}{3}$ in the total length, and the length of the head $3\frac{1}{2}$; the diameter of the eye one-fourth of the length of the head. Jaws equal, the upper maxillary bone reaching nearly to below the middle of the eye. Præoperculum indistinctly notched, the denticulations becoming gradually stronger at the angle: no knob on the interoperculum. Caudalis truncated, pectorals not reaching to the anal fin; the third, fourth and fifth dorsal spines, and the second and third anal spines nearly equal in length and strength. Yellowish olive, with oblique streaks above the lateral line and with longitudinal ones beneath; a black lateral blotch on scales of the 22nd–30th transverse lines.

Red Sea; Seychelles; Seas of Java, Amboyna, and China.

a. Adult. Amboyna. From Mr. Frank's Collection.
b. Half-grown. Amboyna and Ceram. From the Collection of Madame Ida Pfeiffer.
c. Young. Amboyna. Purchased of Mr. Frank.
d. Young. China. Presented by J. R. Reeves, Esq.
e. Young. From the Collection of the Zoological Society.

25. Mesoprion uninotatus.

? Sparus vermicularis, *Bl. Schn.* p. 275.
? Salpa purpurascens variegata, *Catesb.* pl. 17. f. 1.
? Sparus synagris, *L. Gm.* p. 1275; *Bl. Schn.* p. 274.
Dipterodon plumieri, *Lacép.* iv. p. 167.
Mesoprion uninotatus, *Cuv. & Val.* ii. p. 479; *Spix, Fische Brasil.* pl. 65; *Castelnau, Anim. nouv. ou rares de l'Amér. du Sud, Poiss.* p. 4; *Guichen. in Ramon de la Sagra, Hist. Cuba, Poiss.* p. 21.

D. $\frac{10}{12}$. A. $\frac{3}{8}$. L. lat. 47. L. transv. 8/16. Vert. 10/14.

The height of the body is $3\frac{1}{2}$ in the total length, and equal to the length of the head; the upper profile of the head straight, obliquely descending, the lower nearly horizontal. Præoperculum serrated, with a very conspicuous notch; interoperculum without knob. Caudalis slightly emarginate, pectorals just reaching to the front end of the anal fin. Bluish green, with shining golden longitudinal bands; a black lateral blotch.

Caribbean Sea; Coast of Brazil.

a, *b*. Half-grown. Puerto Cabello. Purchased of Mr. Brandt.
c. Fine specimen. Cuba. From the Collection of the Zoological Society.
d, *e*. Adult and half-grown. St. Domingo. Purchased of Mr. Cuming.
f–h. Adult: skins. Jamaica. From Dr. Parnell's Collection.
i, *k*. Half-grown: skins. Jamaica. From Dr. Parnell's Collection.
l. Adult: stuffed. West Indies. From Mr. Scrivener's Collection.
m. Half-grown: stuffed. West Indies. From Mr. Scrivener's Collection.
n. Half-grown: stuffed: not good state. Bahia.
o. Adult: skeleton. West Indies. From the Haslar Collection.
p. Adult. From the Haslar Collection.

Skeleton.—The skeleton of this species differs in the following details from that of *Mesoprion griseus*. The canines of the upper jaw are of moderate size, and there is one other pair only between them; the outer series of the lower jaw is formed by conical teeth, of nearly equal size. The band of the vomerine teeth also is anchor-shaped, but the peduncle is much shorter, occupying the anterior third only of the bone. The palatine band tapers anteriorly and posteriorly. The grooves and ridges between the orbits are more developed, and the occipital crest reaches nearly to the level of the anterior margin of the eye. The outer crest, from the orbit to the præoperculum, is transformed into a muciferous channel. The operculum has a slight notch posteriorly, but no prominent point. The posterior edge of the pharyngo-branchials is fringed and denticulated, which peculiarity is not found in *M. griseus*. The basal portion of the skull is swollen and rounded, as in many *Pristipomatidæ* and *Sciænidæ*, whilst that part is rather compressed in *M. griseus*.

There are ten abdominal and fourteen caudal vertebræ, the length of the former portion of the column being to that of the caudal as 1 : 1·54. The first interhæmal spine is of moderate strength, and equal to the length of the first seven vertebræ together.

26. Mesoprion mahogoni.

Cuv. & Val. ii. p. 447.

D. $\frac{10}{12}$. A. $\frac{3}{8}$.

The length of the head is one-third of the total, the diameter of the eye $3\frac{1}{2}$ in the length of the head; the lower profile of the muzzle as much bent upwards as the upper is downwards. Caudalis notched. Uniform brown, with a large black lateral blotch. (*Cuv.*)

Sea of Martinique.

27. Mesoprion vivanus.

? *Cuv. & Val.* ii. p. 154 (bad description).

D. $\frac{10}{13}$. A. $\frac{3}{8}$. L. lat. 60. L. transv. 10/20.

The height of the body equals the length of the head, and is $3\frac{1}{4}$ in the total. The diameter of the eye is one-sixth (in young individuals one-fifth) of the length of the head, and $2\frac{1}{5}$ (in young $1\frac{2}{3}$) in that of the snout. The upper maxillary reaches to the vertical from the anterior margin of the orbit. Præoperculum with an indistinct notch; interoperculum without knob. The third, fourth, and fifth dorsal spines longest, very much shorter than the longest dorsal and anal rays; the soft dorsal and anal fins elevated; caudal emarginate; pectoral reaching to the anal fin. Coloration uniform, in young individuals with some indistinct cross-bars; no black spot at the base of the pectoral; a black blotch on the lateral line.

Atlantic coasts of Tropical America.

a. 16″ long: skin. Jamaica. From Dr. Parnell's Collection.
b. Adult: skin. Jamaica. From Dr. Parnell's Collection.
c. Half-grown. Bahia. Purchased of M. Parzudaki.
d. Half-grown. Bahia. Purchased of M. Parzudaki.

2. Eleven dorsal spines.

28. **Mesoprion annularis.**

Mesoprion annularis, *Cuv. & Val.* ii. p. 484, iii. p. 497; *Richardson, Ichth. China*, p. 229; *Bleeker, Perc.* p. 47; *Cantor, Catal.* p. 14.
Diacope annularis, *Rüpp. Atl. Fische*, p. 74, and *N. W. Fische*, p. 91. t. 24. f. 2; *Quoy & Gaim. Voy. Astrol. Poiss.* p. 666. pl. 5. f. 4.
—— metallicus, *Bleek. Topogr. Batav.*
Mesoprion sanguineus, *Bleek. Perc.* p. 48.

D. $\frac{11}{13\text{–}15}$. A. $\frac{3}{8\text{–}9}$. L. lat. 56–60.

The height of the body is $2\frac{3}{4}$ in the total length, the length of the head $3\frac{1}{3}$; the diameter of the eye is one-fourth of the latter. Notch and knob of the opercles indistinct, in young specimens more distinct. Caudalis truncated; pectoral reaching to the front end of the anal; the fourth, fifth, and sixth dorsal spines longest; the second of the anal fin much stronger than the third. Red: a blackish streak from the first dorsal spine to the eye; back of the tail with a black white-edged spot; streak and spot sometimes indistinct.

Indian Ocean; Red Sea; Chinese and Japanese Seas.

a. Adult: stuffed: not good state. China. Presented by J. R. Reeves, Esq.
b, c. Adult and young. From the Haslar Collection.
d. Adult.
e. Adult. From the Haslar Collection.
f. Adult. Australian Seas. From Mr. Dring's Collection.
g. Half-grown. China. Presented by J. R. Reeves, Esq.
h. Young. China. Presented by Captain Sir E. Belcher.
i. Young. From the Collection of the College of Surgeons.
k. Young. From the Haslar Collection.

Specimens *h.* and *i.* have alternate blackish and lighter longitudinal bands below the lateral line.

29. **Mesoprion malabaricus.**

? Sparus malabaricus, *Bl. Schn.* p. 278.
? Mesoprion malabaricus, *Cuv. & Val.* ii. p. 480.
Mesoprion malabaricus, *Bleek. Sumatra*, iii. p. 3.

D. $\frac{11}{14}$. A. $\frac{3}{8}$. L. lat. 52.

The height of the body is not quite one-third of the total length, and rather longer than the head; the diameter of the eye is one-third of the length of the head; the upper profile of the head slightly concave. Jaws nearly equal in front; the upper maxillary bone reaches beyond the anterior half of the eye. Præoperculum serrated and slightly emarginate, with stronger denticulations at the angle. Caudalis truncated; the fourth, fifth, and sixth dorsal spines rather longer than the posterior ones; the second of the anal longest and strongest. Rose-coloured (in life), with oblique streaks above the lateral line and with longitudinal ones beneath; a violet longitudinal band on the back along the base of the dorsal fin; a reddish-violet spot on the back of the tail; dorsal and caudal fins with a black edge; spines of the anal and ventral fins white.

Sea of Padang (Sumatra).

a. Half-grown. East Indies. Purchased of Mr. Frank.

Perhaps a variety of the former species.

30. Mesoprion erythropterus.

Lutjanus erythropterus, *Bloch*, t. 249.
Mesoprion erythropterus, *Cuv. & Val.* ii. p. 478; *Bleeker, Perc.* p. 47.
—— xanthopterygius, *Bleek. Perc.* p. 46.

D. $\frac{11}{12-13}$. A. $\frac{3}{8}$. L. lat. 45.

The height of the body is rather more than one-fourth of the total length, the length of the head $3\frac{1}{2}$ in the same length; the diameter of the eye is one-third of the length of the head. Præoperculum not or very slightly emarginate. Caudalis truncated; the dorsal spines slender, the third and fourth longest. Uniform yellowish; fins purplish. (*Bl.*)

Sea of Batavia; Sumbawa.

31. Mesoprion lineolatus.

Diacope lineolata, *Rüpp. Atl. Fische*, p. 76. t. 19. f. 3 (*Bleek. Perc.* p. 46, different).

D. $\frac{11}{12}$. A. $\frac{3}{8}$. L. lat. 52. Cæc. pylor. 4.

The height of the body is one-fourth of the total length; the length of the head is $3\frac{1}{3}$ in the same; the diameter of the eye is a little more than one-third of the length of the head, and not much larger than the distance between the eyes. The lower jaw slightly prominent; the upper maxillary bone reaches to below the middle of the eye. Præoperculum finely serrated and very slightly emarginate behind; knob of interoperculum none. Caudalis truncated, pectoral distant from the anal; dorsal spines moderate, the third, fourth, and fifth longest; the second of the anal fin longer and stronger than the third. Greenish olive, with oblique darker streaks above the lateral line, and with longitudinal beneath.

Red Sea; Amboyna.

a. Adult. Red Sea.
b. Half-grown. Amboyna. From Mr. Frank's Collection.

32. Mesoprion timoriensis.

Diacope timoriensis, *Quoy & Gaim. Voy. du Freyc. Zool.* p. 306. pl. 57. f. 1.
—— calvetii, *Cuv. & Val.* ii. p. 429; *Faun. Japon.* p. 14.

D. $\frac{11}{14}$. A. $\frac{3}{8}$.

The height of the body is not quite one-third of the total length;

the length of the head is $3\frac{1}{2}$ in the same. Jaws nearly equal in front. Præoperculum with a conspicuous notch. Caudalis truncated, pectorals reaching to the middle of the anal. Uniform red.

Sea of Timor; Japan.

33. Mesoprion isodon.

Mesoprion isoodon, *Cuv. & Val.* ix. p. 443.

D. $\frac{11}{15}$. A. $\frac{3}{7}$. L. lat. 50.

The height of the body is $3\frac{1}{2}$ in the total length, and equal to the length of the head. Caudalis truncated. Uniform brownish. Three strong canine teeth in the upper jaw. (*Val.*)

St. Domingo.

3. Twelve dorsal spines.

34. Mesoprion dodecacanthus.

Bleeker, Amboina, iii. p. 104.

D. $\frac{12}{13}$. A. $\frac{3}{8}$. L. lat. 46.

The height of the body is $3\frac{1}{4}$ in the total length, and equal to the length of the head; the diameter of the eye is not fully one-third of the latter. Jaws equal in front, the upper maxillary bone reaching to below the middle of the eye. Præoperculum serrated, slightly emarginate. The spinous part of the dorsal fin much lower than the soft; the first dorsal spine shortest, the others nearly equal in length; the second of the anal longest. Caudalis truncated. Rose-coloured (in life), with oblique brownish streaks; a brown spot on the back of the tail and at the base of the pectoral; the dorsal and caudal fins black-edged; anal fin with a white anterior edge, and with the anterior rays deep violet. (*Bl.*)

Sea of Amboyna.

35. Mesoprion dodecacanthoides.

Bleeker, Amboina, v. p. 489.

D. $\frac{12}{13}$. A. $\frac{3}{8}$. L. lat. 46.

The height of the body is $3\frac{1}{2}$ in the total length, and equal to the length of the head; the diameter of the eye is not fully one-third of the latter. Jaws nearly equal in front, the upper maxillary bone reaching to below the anterior half of the eye. Præoperculum not or very slightly emarginate, serrated, with stronger denticulations beneath and at the angle. The spinous part of the dorsal fin higher than the soft; the fourth spine to the seventh equal in length and higher than the others; the second of the anal fin longest. Caudalis very slightly emarginate. Rose-coloured (in life), with seven oblique brownish streaks; a brownish spot on the back of the tail; fins yellow.

Sea of Amboyna. Madras.

a. Half-grown: not good state. Madras. Presented by J. C. Jerdon, Esq.

36. **Mesoprion aurorubens.**

Centropristes aurorubens, *Cuv. & Val.* iii. p. 45.

D. $\frac{12}{11}$. A. $\frac{3}{8}$. L. lat. 54. L. transv. 8/19. Cæc. pylor. 4. Vert. 10/14.

Vomerine teeth in a broad quadrangular patch, with the anterior sides shortest (◇). Præoperculum with a very indistinct notch, more conspicuous in young individuals. Dorsal fin even, caudal fin notched; the third anal spine longest. Coloration uniform.

Atlantic coasts of Tropical America.

a, b. Adult: skins. Jamaica. From Dr. Parnell's Collection.
c. Half-grown: skin. Jamaica. Purchased of Mr. Cuming.

This fish has been placed in the genus *Centropristis*, but it is much nearer to *Mesoprion*, with which it agrees in the structure of the præoperculum; it may, however, be the type of a peculiar genus distinguished by an arrangement of the vomerine teeth which is scarcely to be found in other species of *Mesoprion*, and an increased number of dorsal spines. The canines are very small.

B. With a more or less broad, distinct, blackish lateral *band.*

37. **Mesoprion vitta.**

Serranus vitta, *Quoy & Gaim. Voy. de Freyc. Zool. Poiss.* pl. 58. f. 3. p. 315; *Richardson, Ichth. China*, p. 234.
? Serranus vitta, *Cuv. & Val.* ii. p. 239, vi. p. 505.
Diacope vitta, *Schleg. & Temm. Faun. Japon.* p. 13. pl. 6. f. 1.
? Mesoprion vitta, *Bleeker, Perc.* p. 44.
Mesoprion phaiotæniatus, *Bleeker, Perc.* p. 43.

D. $\frac{10}{13\text{–}14}$. A. $\frac{3}{8}$. L. lat. 55–62.

The height of the body is $3\frac{1}{2}$ in the total length, and nearly equal to the length of the head; the diameter of the eye is one-fourth of the latter; the upper profile of the head is very slightly concave; notch of præoperculum and knob of interoperculum conspicuous. Jaws nearly equal in front; the upper maxillary bone reaches not quite to below the middle of the eye. Caudalis truncated or very slightly emarginate; pectoral not reaching to the front end of the anal; the dorsal spines are rather slender, the third and fourth longest; the second and third of the anal fin are nearly equal in length, the second stronger. Olive (in spirits), with conspicuous oblique streaks above the lateral line and with longitudinal ones beneath; a broader blackish band from the eye to the back of the caudal fin; dorsal and caudal fins blackish, the others yellowish; no black spot at the base of the pectoral.

Japanese, Chinese, and Javanese Seas; Amboyna; Louisiade Archipelago; Island of Waigiou; north coast of Australia.

a. Half-grown: skin. Chinese Seas. Purchased of Mr. Warwick.
b. Young: not good state. Hong Kong. From the Haslar Collection.
c. Adult. Amboyna. From Mr. Frank's Collection.
d. Young. Amboyna. Purchased of Mr. Frank.
e. Half-grown. Molucca Sea. From Mr. Frank's Collection.
f. Half-grown: stuffed. Louisiade Archipelago. Presented by the Lords of the Admiralty.
g. Half-grown: stuffed. Louisiade Archipelago. Voyage of the Rattlesnake.
h. Half-grown: stuffed. Louisiade Archipelago. (15 fathoms.) Voyage of the Rattlesnake.
i. Half-grown: stuffed. Louisiade Archipelago (Chaumont Island). Voyage of the Rattlesnake.
k. Adult: stuffed. Port Essington. Collected by Macgillivray.
l, m. Young. From the Haslar Collection.
n. Adult: stuffed.

Cuv. and Val. quote for their description the species of Quoy and Gaimard, but give eleven spines for the dorsal fin. The description and figure in the 'Zoologie de la Voyage, par L. de Freycinet,' perfectly agree with each other, as well as with the species of the 'Fauna Japonica' and with our specimens. The number given in the 'Hist. Nat. des Poissons' appears to be wrong.

38. **Mesoprion bleekeri.**

Mesoprion lineolatus, *Bleeker, Perc.* p. 46. (Diacope lineolata, *Rüpp.* different.)

D. $\frac{11}{12}$. A. $\frac{3}{8}$. L. lat. 60.

The height of the body is $4\frac{1}{3}$ in the total length, and the length of the head is $3\frac{1}{2}$; the diameter of the eye is one-fourth of the latter. Muzzle rather narrow, with the lower profile as much ascending as the upper is descending. Jaws equal in front, the upper maxillary bone reaching to below the anterior half of the eye. Præoperculum serrated, with rather prominent and stronger denticulated angle; suprascapula serrated. Caudalis truncated; pectoral small, short, not reaching beyond the end of the ventral; the third, fourth, and fifth dorsal spines longest, all being slender; the second of the anal rather thinner and shorter than the third. Yellowish olive, with a blackish longitudinal band from the eye to the caudal fin.

Sea of Batavia; Amboyna.

a. Adult. Amboyna. From Mr. Frank's Collection.
b. Half-grown. Amboyna. From Mr. Frank's Collection.
c. Young. Amboyna. From Mr. Frank's Collection.

39. Mesoprion enneacanthus.

Bleeker, Perc. p. 40.

D. $\frac{9}{13}$. A. $\frac{3}{8}$. L. lat. 50.

The height of the body is $3\frac{3}{4}$ in the total length, and the length of the head $3\frac{1}{2}$. Præoperculum serrated, with a slight notch behind; operculum with a single flat spine. Caudalis forked; the second and third dorsal spines longest, the first longer than the last. Oblique streaks above the lateral line; a blackish band from the eye to the caudal. No lateral blotch. (*Bl.*)

Sea of Batavia.

C. With permanent blackish *cross-bands.*

40. Mesoprion semicinctus.

Lutjanus semicinctus, *Quoy & Gaim. Voy. Freyc. Zool.* p. 303.
Mesoprion semicinctus, *Cuv. & Val.* ii. p. 485; *Bleeker, Amboina,* iv. p. 331.

D. $\frac{10}{13}$. A. $\frac{3}{8}$. L. lat. 50.

The length of the head is $3\frac{1}{4}$ in the total, and nearly equal to the height of the body; the diameter of the eye is one-fourth of the length of the head; the upper profile of the head straight-lined. Jaws equal in front, the upper maxillary bone reaching to below the anterior half of the eye. Præoperculum slightly emarginate, with stronger denticulations at the angle. Caudalis slightly emarginate; the spinous and soft parts of the dorsal fin equal in height; the fourth and fifth spines and the second of the anal longest. Olive, with nine blackish cross-bands; tail behind with a large round black spot; the spinous part of the dorsal fin brown-edged.

Seas of Waigiou, Rauwack, and Amboyna.

D. With several distinct longitudinal bands.

41. Mesoprion quinquelineatus.

Russell, ii. pl. 110.
Mesoprion quinquelineatus, *Cuv. & Val.* ii. p. 445.
? Diacope cæruleolineata, *Rüpp. N. W. Fische,* p. 93. t. 24. f. 3.

D. $\frac{10}{14}$. A. $\frac{3}{8}$.

Yellowish grey, with five narrow blue longitudinal lines and a lateral blotch of the same colour; fins with an orange-coloured edge.

(Red Sea); Javanese Sea.

a. Adult. Sine patria. D. $\frac{10}{14}$. A. $\frac{3}{9}$. L. lat. 80.

42. Mesoprion sobra.

Cuv. & Val. ii. p. 453; *Guichen. in Ramon de la Sagra, Hist. Cuba, Poiss.* p. 22.

D. $\frac{10}{14}$. A. $\frac{3}{8}$.

The height of the body is $3\frac{1}{2}$ in the total length, and equal to the

length of the head; the upper profile of the head is straight, obliquely descending, the lower nearly horizontal. Præoperculum serrated, not notched; interoperculum with a protuberance. Caudalis notched; pectorals not reaching to the anal fin. Yellowish olive, with about fourteen blue longitudinal streaks; three blue streaks on the cheeks, and a white one on the suborbital; a black lateral blotch.

Caribbean Sea.

a. Half-grown. West Indies.
b. Half-grown. West Indies.
c. Half-grown. West Indies.
d–f. Young. West Indies.

43. **Mesoprion decussatus.**

Cuv. & Val. ii. p. 487; *Bleeker, Perc.* p. 43.

D. $\frac{10}{13}$. A. $\frac{3}{8}$. L. lat. 55.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $3\frac{1}{3}$; the diameter of the eye is $4\frac{1}{3}$ in the latter. Jaws equal in front, the upper maxillary bone reaching to below the anterior half of the eye. The notch and the knob of the opercles indistinct. Caudalis slightly emarginate; pectoral just reaching to the front end of the anal; the third to sixth dorsal spines longest; the second and third of the anal fin nearly equal. Silvery white (in spirits), with five straight brown longitudinal bands, the three upper of which are crossed by six or seven vertical ones.

Sea of Java; Philippines.

a. Adult. Philippines.
b. Adult. India.
c. $3\frac{3}{4}''$ long. Amboyna. From Mr. Frank's Collection as Mesoprion chrysotænia. Young (?); with a large lateral blotch.

II. Species with anomalously armed præoperculum.

44. **Mesoprion retrospinis.**

Cuv. & Val. vi. p. 541.

D. $\frac{10}{14}$. A. $\frac{3}{8}$.

The length of the head is $3\frac{1}{3}$ in the total; the diameter of the eye one-seventh of the length of the head. Præoperculum without notch, and with four or five rather strong teeth beneath; interoperculum without knob. Caudalis truncated. Uniform yellowish olive. (*Val.*)

West Indies.

45. **Mesoprion pomacanthus.**

Bleeker, Amboina, vi. p. 407.

D. $\frac{10}{13}$. A. $\frac{3}{8}$. L. lat. 50.

The height of the body is $3\frac{1}{2}$ in the total length, and equal to the

length of the head; the diameter of the eye is one-third of the latter. The upper maxillary bone reaching to below the anterior half of the eye. Præoperculum serrated, not notched, and with a very long spinous tooth at the angle, reaching to the gill-opening. The second dorsal spine longest. Caudalis slightly emarginate. Yellow, with two or three blue longitudinal bands. (*Bl.*)

Sea of Amboyna.

38. GLAUCOSOMA.

Glaucosoma, *Temm. & Schleg. Faun. Japon. Poiss.* p. 62; *Richards. Voy. Ereb. & Terr. Fishes*, p. 27.

Seven, occasionally eight branchiostegals. All the teeth villiform, without canines; teeth on the palatines. One dorsal, with eight spines, the anal fin with three. Operculum with two flat points; præoperculum crenulated. Scales moderate; head entirely covered with scales.

From the Japanese Sea to the Australian coasts.

1. Glaucosoma burgeri.

Glaucosoma, sp., *Faun. Japon.* p. 62. pl. 67.
—— bürgeri, *Richards. Voy. of Ereb. & Terror, Fishes*, p. 27.
—— hebraïcum, *Richards. l. c.* p. 27. pl. 17.

D. $\frac{8}{11}$. A. $\frac{3}{9}$. L. lat. 48. L. transv. $\frac{10}{20}$.

The height of the body is $3\frac{1}{2}$ in the total length, and nearly equal to the length of the head; the diameter of the eye is nearly one-fifth of the latter. The upper maxillary bone reaches to beneath the posterior third of the eye; the whole snout densely scaly; operculum with two flat thin obtuse tips; suprascapula not visible. Caudalis truncated, with slightly convex angles; the first rays of the dorsal fin longest. Back more or less distinctly marbled with black.

Sea of Japan; Houtman's Abrolhos, south-western coast of Australia.

Temminck and Schlegel described and figured a Japanese fish from a drawing of Bürger, considering it the type of a new genus, *Glaucosoma*. Sir John Richardson afterwards discovered, in the Collection of the British Museum, two similar, stuffed specimens from Australia; he thought them to be different from the Japanese one, and gave to the latter the specific appellation of *bürgeri*, to the former that of *hebraïcum*. There can be no doubt of their specific difference if we compare the figures only, the first dorsal rays of the one being much elongate, those of the other having the same length as the middle ones. But on comparing the typical specimens of *G. hebraïcum* with the figure of *G. bürgeri*, I could not convince myself of the real existence of two species. They agree perfectly with that figure in the form of the head and of the body, and in the number of the spines and rays. The first dorsal rays are broken—a very common occurrence, owing to the bad practice of preserving fishes in a dried or stuffed state; and if they were at all elongate, they appear to be much less so than in the figure in the 'Ichthyology of the Erebus and Terror.' On the other hand, an apparently incomplete drawing, made from a single fish, like that in the 'Fauna Japonica,' does not afford sufficient authority as to the form of the single rays. With regard to the different coloration, the larger specimen of the two in the British Museum is nearly uniform, although much darker than the figure of the Japanese fish; the other exhibits very distinctly the variegated coloration given by Sir J. Richardson. Thus, not having other materials than Sir John Richardson had, I do not think myself justified in separating the following specimens from the species of the 'Fauna Japonica.'

a, b. Large specimens: stuffed. Houtman's Abrolhos. (Jew-fish.)

Third Group. PENTACERATINA.

39. PENTACEROS.

Pentaceros, *Cuv. & Val.* iii. p. 30.

Seven branchiostegals. Body high, triangular. All the teeth villiform; teeth on the vomer; palatines? One dorsal with ten, twelve, or fourteen, the anal fin with four or five spines; all the spines strong. Operculum rounded; præoperculum denticulated. Scales rather small, sometimes osseous, strongly adherent; head above without soft integuments.

Cape Sea; Pacific.

1. Pentaceros richardsonii.

Smith, Illustr. S. Afr. Fishes, pl. 21 (ventral spine much too feeble).

D. $\frac{14}{10}$. A. $\frac{4}{8}$.

The height of the body is $2\frac{3}{4}$ in the total length, the length of the head $3\frac{2}{3}$; all the bones of the skull without soft integuments; scales rather small, ciliated. Ventral spine very long and strong. The triangular space between the ventrals and the throat much narrower than long. Coloration uniform brown.

Cape Point.

a. Original specimen of Sir A. Smith's description.

2. Pentaceros capensis.

Cuv. & Val. iii. p. 30. pl. 43.

D. $\frac{12}{12}$. A. $\frac{5}{7}$. Cæc. pylor. 9.

The height of the body is one-half of the total length, the length of the head one-third. Ventral spine very thick and strong. The triangular space between the ventrals and the throat much narrower than long. Yellowish, marbled with brown.

Cape of Good Hope.

3. Pentaceros decacanthus. (PLATE XV. fig. A.)

$D. \frac{10}{13}. \quad A. \frac{4}{8}.$

The height of the body is one-half of the total length, the length of the head not quite one-third. Ventral spine very thick and strong. The triangular space between the ventrals and the throat as broad as long. Yellowish, marbled with brown.

a. Has been dried. Pacific. Voyage of the Herald.

Description of the specimen.—In general appearance this species much resembles the preceding, but it is still higher, and the much greater breadth of the breast gives a very good distinctive character. The outline of the lower profile is horizontal from the jaws to the anus; behind the vent it suddenly rises to near the caudal fin; the upper profile is very curved, but does not descend so far behind as in front. The eye is placed high up the sides, without interfering with the upper profile; above its middle a spinous process projects from the frontal bone, and there are, besides, several very small spines in front of the larger one. The diameter of the eye is nearly one-third of the length of the head, and equals the interspace between the eyes. All the upper surface of the head appears to be bony, without being covered by a soft skin; it is striated, the streaks radiating from a centre above each eye. The nostrils are close together, one before the other, and placed immediately in front of the upper angle of the eye: the anterior is very small, ovate; the posterior larger, round. The snout is rather shorter than the diameter of the eye; the cleft of the mouth is very oblique; the lower jaw prominent. Both the jaws are armed with bands of fine villiform teeth: a small patch of vomerine teeth is distinctly visible, but I am unable to see further to the palatine bones. The upper maxillary does not appear to reach the front edge of the orbit, and may be partly hidden beneath the anterior suborbital bone; this is large, and armed with several strong denticulations below, and with very small ones at its orbital margin; the remainder of the infraorbital arch is not denticulated. There is a rhomboidal bone with a prominent longitudinal ridge on the occiput. All the bones of the humeral arch and the opercles are strongly striated. The scapulary has a prominent ridge terminating in a spine. The operculum is entire and has a waving margin; the præoperculum has a rounded angle and is denticulated throughout, the spinous teeth being stronger beneath. Cheeks scaly. The gill-opening is wide; but I cannot count the branchiostegals on account of the condition of the specimen.

The pectorals are inserted at the lower third of the height of the body; they are pointed, and appear to reach to the vent. The ventrals are very remote from each other; their spine arises just behind and below the root of the pectoral; it is very strong and long, two-thirds of the length of the head, flattened, sharp outside, and striated; the first ray is the longest, scarcely longer than the spine

The dorsal fin commences above the humeral; it has ten strong spines, longitudinally striated; the third and fourth are longest, their length being $3\frac{1}{2}$ in the height of the body. The membrane between the spines extends to the upper third. The length of the base of the soft portion is more than one-half of that of the spinous. The rays are broken off.

The origin of the anal fin falls below the end of the dorsal. The first spine is scarcely shorter than the second, which is shortest; the two others are shorter, but nearly equal in length.

Caudal rounded?

The scales are osseous, very adherent, not striated, each with three or four prominences behind; those of the breast are largest; the fins are entirely scaleless. The lateral line commences behind the scapulary spine, and is very curved on the trunk, like the back.

The ground-colour now is yellowish, largely marbled with brownish. The spinous portion of the dorsal and the ventrals are brown; the other fins yellowish.

	inches.	lines.
Total length	1	8
Height of the body	0	10
Length of the head	0	7
——— of third dorsal spine	0	$2\frac{2}{3}$
——— of second anal spine	0	$1\frac{2}{3}$
——— of ventral spine	0	5
Interspace between the ventrals	0	6

40. OREOSOMA.

Oreosoma, *Cuv. & Val.* iv. p. 515.

Seven branchiostegals. Body high. All the teeth villiform; teeth on the jaws, vomer, and palatine bones. Two dorsals, the first with five spines; anal long, without spines. Opercles not serrated nor armed; operculum with two ridges, terminating in flat angles. No true scales, but with large, conical, bony protuberances, symmetrically arranged.

Atlantic.

1. Oreosoma atlanticum.

Cuv. & Val. iv. p. 515. pl. 99.

D. $\frac{5}{29}$. A. 26. V. 1/5.

With 25 or 26 large, conical, bony protuberances, four of which are on the back. (*Cuv.*)

Atlantic.

Fourth Group. PRIACANTHINA.

41. PRIACANTHUS*.

Priacanthus, *Cuv. & Val.* iii. p. 96.

Six branchiostegals. All the teeth villiform, without canines; teeth on the palatine bones; tongue smooth. One dorsal, with ten spines; the anal fin with three. Operculum with an indistinct point; præoperculum serrated, with a more or less prominent, flat, crenulated angle. Scales small, rough; snout covered with ctenoid scales. Lower jaw with prominent chin; eye large.

Seas of the tropical regions (Australian Seas?).

1. **Priacanthus macrophthalmus.**

Priacanthus macrophthalmus, *Cuv. & Val.* iii. p. 97 (not *Bloch*); *Stannius in Müller's Archiv*, 1848, p. 399 (on the swim-bladder).
—— arenatus, *Cuv. & Val.* iii. p. 101.
—— fulgens, *Lowe, Trans. Zool. Soc.* ii. p. 174.

D. $\frac{10}{13-14}$. A. $\frac{3}{14-15}$. L. lat. 80–85. Vert. 9/13. Cæc. pylor. 5.

The height of the body is $3\frac{1}{3}$ in the total length, the length of the head is rather more than one-fourth of the latter; the diameter of the eye is $2\frac{2}{3}$ in the length of the head. The posterior opening of the nostril is a long slit, three times as long as broad; the maxillary bone reaching a little beyond the anterior margin of the eye. Angle of the præoperculum obtuse, with a short flat spine in the male; operculum with two short spines; sub- and interoperculum entire. Caudalis truncated; the dorsal and anal spines gradually becoming longer behind, the first ones with a rough surface; the length of the second dorsal spine is $1\frac{2}{3}$ in that of the last; the ventral fins reaching beyond the front end of the anal, the pectorals much shorter. Uniform red; fins with a blackish edge.

Caribbean Sea; Coast of Brazil; Madeira.

a. Fine specimen: male. Cuba. Presented by the Zoological Society.
b–e. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.
f–h. Half-grown: male. W. Indies.
i. Fine specimen: female. Madeira. Presented by the Rev. R. T. Lowe (=*Priacanthus fulgens*, Lowe).

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* 1. Labrus cruentatus, *Lacép.* iii. p. 522. pl. 2. f. 3.—Priacanthus cruentatus, *Cuv. & Val.* iii. p. 102.—Atlantic.
2. Priacanthus argenteus, *Cuv. & Val.* iii. p. 109; *Renard*, i. pl. 12. f. 72.—East Indies.
3. Priacanthus macropterus, *Cuv. & Val.* vii. p. 471; *Quoy & Gaim. Voy. de l'Astrol.* pl. 7. f. 4.—St. Helena.
4. Priacanthus fax, *Cuv. & Val.* vii. p. 473.—Seychelles.

k. Adult: stuffed. W. Indies.
l. Adult: skin. W. Indies. From Mr. Scrivener's Collection.
m. Half-grown: stuffed. W. Indies. From Mr. Scrivener's Collection.
n. Half-grown: stuffed. Atlantic.

2. Priacanthus boops.

Perca boops, *Forster.*
Anthias boops, *Bl. Schn.* p. 308.
Priacanthus boops, *Cuv. & Val.* iii. p. 103; *Barker-Webb & Berthelot, Hist Nat. Iles Canaries, Ichthyol.* p. 12. pl. 3. f. 2; *Peters, Wiegm. Arch.* 1855, p. 238.
—— macropus, *Quoy & Gaim. Voy. de l'Astrol. Zool.* iii. p. 668. pl.7. f. 1.

D. $\frac{10}{12}$. A. $\frac{3}{13}$. L. lat. 70.

The height of the body is equal to the length of the head and $3\frac{2}{3}$ in the total; the diameter of the eye is nearly *one-third* of the length of the head. The posterior opening of the nostril is a long broad cavity, nearly three times as long as broad; the maxillary bone reaching a little beyond the anterior margin of the orbit. Angle of præoperculum obtuse, with a very distinct, serrated, triangular, flat spine; operculum with two short spines; sub- and interoperculum minutely serrated. Caudalis truncated; all the spines and rays of the dorsal and anal fins with a striated or rough surface; the length of the second dorsal spine is $2\frac{1}{2}$ in that of the last. Rose-coloured; the vertical fins with a blackish edge.

St. Helena; coast of Mozambique.

a. Large specimen: stuffed. St. Helena. Presented by General Hardwicke.
b. Adult: stuffed. St. Helena. Presented by General Hardwicke.
c. Adult. Sine patria.

Valenciennes describes (vol. vii. p. 469) a species procured by Quoy and Gaimard on the voyage of the 'Astrolabe,' naming it *Priacanthus macropus,* on account of the elongated ventral fins, which are one-third of the total length. This character alone would prove its specific difference from *Pr. boops.* But there is another fish, figured by Quoy and Gaimard, which they state to be the same as the fish of Valenciennes, and having the ventral fins of moderate length. There can be no doubt that the specimens in the British Museum, or the *Perca boops* of Forster, are identical with that figure; but I cannot venture to bring the fish of Valenciennes into the synonymy of *Pr. boops.*

3. Priacanthus bonariensis.

Cuv. & Val. iii. p. 105.

D. $\frac{10}{13}$. A. $\frac{3}{13}$. L. lat. 80.

The height of the body is $2\frac{3}{4}$ in the total length, the length of the head $3\frac{2}{3}$; the diameter of the eye is nearly one-third of the latter.

The posterior opening of the nostrils is a long, broad, ear-shaped cavity, narrowest in the middle. The angle of the præoperculum is obtuse, with a more or less cylindrical spine of moderate length; operculum with two short spines, a third larger one above, belonging to the scapular bone; sub- and interoperculum minutely serrated. Caudalis truncated; all the spines and rays of the dorsal and anal fins with a striated or rough surface; the length of the second dorsal spine is nearly three times in that of the last; ventral fins very long, extending to the third soft ray of the anal. Rose-coloured; dorsal and ventral fins nearly entirely black; anal and caudal fins with a broad black margin; pectorals yellowish.

Atlantic shores of South America.

a. Adult. S. America. Presented by Sir R. Schomburgk.
b. Young. Sine patria.

4. Priacanthus japonicus.

Priacanthus japonicus, (*Langsdorf*) *Cuv. & Val.* iii. p. 106. pl. 50; *Faun. Japon.* p. 20 (not *Bleek.*).

D. $\frac{10}{12-13}$. A. $\frac{3}{12-13}$. L. lat. 70.

The height of the body is nearly three times in the total length, the length of the head $3\frac{1}{3}$; the diameter of the eye is two-fifths of the latter. The posterior opening of the nostrils is long, broad, ear-shaped, wider above than beneath. The angle of the præoperculum obtuse, with an acute, not serrated, triangular spine; operculum with two small spines, a third larger one above, belonging to the scapular bone; sub- and interoperculum minutely serrated. Caudalis truncated; all the spines and rays of the dorsal and anal fins with a striated or rough surface; the last dorsal spine is $2\frac{1}{3}$ as long as the second, and much longer than the diameter of the eye; ventrals very long, extending beyond the third soft ray of the anal. Rose-coloured; the spinous dorsal and the ventrals black.

Cape Seas; Chinese and Japanese Seas.

a. Adult: stuffed. Cape Seas. Presented by Sir A. Smith.
b. Skin, in spirits. Japan.
c. Skin, in spirits. Japan.
d. Skin, in spirits. Japan.
e. Skin, in spirits. Japan. From Mr. Frank's Collection.
f. Young. China Sea. Presented by Captain Sir Edward Belcher.

This fish is probably only a climatal variety of *Pr. bonariensis*.

5. Priacanthus niphonius.

Cuv. & Val. iii. p. 107; *Faun. Japon. Poiss.* p. 21. pl. 7 *a*. f. 1, 2.

D. $\frac{10}{11-12}$. A. $\frac{3}{10-11}$. L. lat. 50.

The height of the body is $2\frac{2}{3}$ in the total length, the length of

the head $3\frac{1}{3}$; the diameter of the eye is $2\frac{1}{3}$ in the latter. The posterior opening of the nostrils is long, wide, situated on the upper part of the head, semilunar, with the convexity turned forwards. The angle of the præoperculum obtuse, with a very indistinct spine; operculum with two inconspicuous spines; sub- and interoperculum and scapular bones serrated. Caudalis truncated; all the spines and rays of the dorsal and anal fins rough or striated; the second and the last dorsal spines nearly equal in length, the fifth longest; the ventrals reach to the anus. Rose-coloured; fins immaculate; the ventrals more or less blackish.

Japanese Sea.

a. Skin, in spirits. Japan.
b, *c*. Adult: stuffed. Japan. From Mr. Frank's Collection.

6. **Priacanthus blochii.**

Anthias macrophthalmus, *Bl.* vi. p. 115. t. 319; *Bl. Schn.* p. 304.
Priacanthus japonicus, *Bleeker, Natuurk. Tydschr. Nederl. Indie*, ii. p. 171 (not *Cuv. & Val.*).
—— blochii, *Bleek. l. c.* iv. p. 456.

$$D. \frac{10}{13\text{–}14}. \quad A. \frac{3}{14\text{–}15}. \quad L. lat. 70.$$

The height of the body is equal to the length of the head, and $3\frac{1}{2}$ in the total; the diameter of the eye is two-fifths of the length of the head. The posterior opening of the nostrils is a long, narrow, elliptical slit. The angle of the præoperculum is rather obtuse, with a slightly projecting, flat, triangular spine; operculum with two small spines; sub- and interoperculum entire. Caudalis truncated; all the spines and rays of the dorsal and anal fins rough; the last dorsal spine longest, equal to the diameter of the eye, and rather more than twice the length of the second; the ventral fins extending beyond the front end of the anal. Rose-coloured; the vertical and ventral fins with black margins.

Sea of Amboyna; Sumatra.

a. Adult. Moluccas. From Mr. Frank's Collection as *Pr. macrophthalmus*.
b. Half-grown. Amboyna. From Mr. Frank's Collection.
c. Young. Amboyna. From Mr. Frank's Collection.

7. **Priacanthus benmebari.**

Temm. & Schleg. Faun. Japon. p. 19. pl. 7. f. 1; *Krusenstern*, p. 53. f. 2; *Richardson, Ichthyol. China and Japan*, p. 237.

$$D. \frac{10}{13}. \quad A. \frac{3}{14}. \quad L. lat. 75\text{–}80.$$

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $3\frac{2}{3}$; the diameter of the eye is $2\frac{3}{4}$ in the latter. The posterior opening of the nostril elliptical, about $2\frac{1}{2}$ as long as broad.

The angle of the præoperculum slightly obtuse, with a flat, rather elongate, serrated spine; operculum with two very small spines; sub- and interoperculum with excessively fine denticulations. Caudalis truncated; dorsal and anal spines very slender, neither rough nor striated; the last of the dorsal fin hardly longer than the eighth and ninth, and $1\frac{1}{2}$ as long as the second; the ventral fins reaching to the anal, but shorter than that fin. Red; dorsal, anal, and ventral fins paler, with round yellow spots.

Japanese Seas.

a. Adult: stuffed. Japan. From the Leyden Museum.

8. **Priacanthus hamruhr.**

Sciæna hamruhr, *Forsk.* p. 45.
Anthias hamruhr, *Bl. Schn.* p. 307.
Lutjanus hamruhr, *Lacép.* iv. p. 209.
Priacanthus hamruhr, *Cuv. & Val.* iii. p. 104; *Rüpp. N. W. Fische*, p. 95.

D. $\frac{10}{12-15}$. A. $\frac{3}{15}$. L. lat. 85. Vert. 9/13.

Allied to *Pr. benmebari*.

The height of the body is nearly equal to the length of the head, and rather more than one-fourth of the total; the diameter of the eye is nearly one-third of the length of the head. The posterior opening of the nostrils is a very long slit, four times as long as broad. The angle of the præoperculum obtuse, with a prominent keel instead of a free spine; operculum obtusely serrated, with a very small spine; sub- and interoperculum ?. Caudalis more or less emarginate; all the anal and dorsal spines slender, smooth; the rays of the anal fin rough, those of the dorsal smooth; the last dorsal spine is $1\frac{2}{3}$ as long as the second, the ventrals extending to the front end of the anal. Rose-coloured; fins immaculate, the vertical fins with a blackish margin.

Red Sea.

a. Adult: stuffed. Red Sea. From the Frankfort Museum.

9. **Priacanthus carolinus.**

Cuv. & Val. iii. p. 105; *Less. Voy. Coq. Zool. Poiss.* p. 224; *Bleeker, Banda*, i. p. 235.

D. $\frac{10}{12-13}$. A. $\frac{3}{13-14}$. L. lat. 85.

The height of the body is $3\frac{1}{3}$ in the total length, the length of the head $3\frac{3}{4}$; the diameter of the eye is two-fifths of the latter. The angle of the præoperculum obtuse, with a serrated spine of moderate length; operculum with a single small spine; sub- and interoperculum entire; the last dorsal spine equal to the diameter of the eye. Caudalis truncated; the ventral fins reaching beyond the first anal spine. Rose-coloured; the caudal and the soft portions of the dorsal and anal fins with numerous black dots. (*Bl.*)

Island of Oualand (Carolines); Banda Neira.

10. Priacanthus schmittii.

Bleeker, Sumatra, i. p. 572.

D. $\frac{10}{12}$. A. $\frac{3}{12-13}$. L. lat. 65.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $3\frac{1}{3}$; the diameter of the eye is three-sevenths of the latter. The angle of the præoperculum obtuse, with a serrated spine of moderate length; operculum with two small spines. Caudalis truncated; the last dorsal spine shorter than the diameter of the eye; the ventral fins not extending to the anal fin. Rose-coloured; fins immaculate; the ventrals reddish violet, with a white spot on the membrane connecting the fifth ray with the belly. (*Bl.*)

Sea of Padang.

11. Priacanthus holocentrum.

Bleeker, Perc. p. 48.

D. $\frac{10}{13}$. A. $\frac{3}{14}$. L. lat. 65.

Allied to *Pr. tayenus.*

The height of the body is equal to the length of the head, and $3\frac{1}{2}$ in the total; the diameter of the eye is $2\frac{1}{3}$ in the length of the head. Præoperculum with a very long serrated spine, extending beyond the posterior limb of the operculum; operculum with two small spines. Caudalis truncated; the second spine of the dorsal is two-thirds of the last, which is the longest; the ventrals reach to the front end of the anal fin. Rose-coloured; dorsal and anal fins black-edged; ventrals with black spots; the membrane between the ventrals and the belly with a black spot.

Batavia; Sumatra.

a. Half-grown. Sumatra. (Named *Priacanthus pœcilopterus*?)
b. Half-grown: dried. This specimen perfectly agrees with the other one, but is said to have been procured from the London market (?).

12. Priacanthus macracanthus.

Priacanthus macracanthus, *Cuv. & Val.* iii. p. 108; *Less. Voy. Coq. Zool. Poiss.* p. 225; *Bleek. Perc.* p. 48.
—— fax, *Bleek. Topogr. Batav.*

D. $\frac{10}{14}$. A. $\frac{3}{15}$. L. lat. 90.

The height of the body is equal to the length of the head, and $3\frac{1}{2}$ in the total length; the diameter of the eye is $2\frac{1}{3}$ in the length of the head. Præoperculum with a long, flat, serrated spine, extending beyond the hinder margin of the interoperculum; operculum with two small spines. Caudalis truncated. Uniform rose-coloured; pectoral and ventral fins yellowish.

Amboyna; Batavia; Japan.

a. Skin, in spirits. Japan.

13. Priacanthus dubius.

Temm. & Schleg. Faun. Japon. Poiss. p. 19.

D. $\frac{10}{14}$. A. $\frac{3}{16}$.

Caudalis forked. The height of the body is more than one-third of the total length. Angle of the præoperculum obtuse, and with a short, flat, serrated spine. Ventral fins elongate, extending to the third anal spine; fins immaculate; the dorsal and anal with a blackish margin; the ventrals blackish, with a black spot at the base. (*Schleg.*)

Japanese Sea.

14. Priacanthus tayenus.

Priacanthus tayenus, *Richards. Ichth. of the Seas of China,* p. 237.

D. $\frac{9-10}{12}$. A. $\frac{3}{12-13}$. L. lat. 75.

Caudalis forked, with lengthened tips. The height of the body is one-fourth of the total length; the diameter of the eye nearly one-half of the length of the head, or twice as large as its distance from the end of the snout. The spine of the præoperculum long and serrated. All the dorsal and anal spines are feeble and slender; the second of the dorsal fin is two-thirds of the last, which is the longest; the ventral fins reach only to the anus. Rose-coloured; the ventrals with the connecting membrane brown-spotted.

Chinese Sea.

a. Adult. Canton. Presented by J. R. Reeves, Esq.

15. Priacanthus speculum.

Cuv. & Val. vii. p. 471; *Règne Anim. Ill. Poiss.* pl. 11. f. 1.

D. $\frac{10}{14}$. A. $\frac{3}{15}$.

Caudalis forked. The height of the body is equal to the length of the head, and one-fourth of the total; the diameter of the eye is $2\frac{2}{3}$ in the length of the head, and equal to its distance from the end of the snout. Præoperculum with a very obsolete spine; the length of the anal fin is one-half of the height of the body. Red: anal edged with blackish; ventrals violet. (*Val.*)

Seychelles.

Fifth Group. APOGONINA.

42. AMBASSIS *

Chanda, sp., *Buch. Ham. Fish. of Ganges,* p. 103.
Ambassis, (*Commers.*) *Cuv. & Val.* ii. p. 175.
Bogoda (and Ambassis), *Bleek. Nalez. Ichth. Faun. Beng. en Hindost.* p. 89.

Six branchiostegals. Teeth villiform, without conspicuously larger canines; teeth on the palatine bones. Two dorsals, the first with seven, the anal fin with three spines; a recumbent spine in front of the dorsal, pointing forwards. Operculum without a prominent spine; the lower limb of the præoperculum with a double denticulated edge †. Scales large, deciduous.

Small fishes, living in the fresh and brackish waters and in the seas of the Indian Region; North Australia; Dalmatia.

A. *Species with the anal fin of moderate length* (9–11 rays).

1. Ambassis robustus.

D. $7 \mid \frac{1}{10}$. A. $\frac{3}{9}$. L. lat. 46. L. transv. $\frac{7}{16\text{–}17}$.

The height of the body is rather more than twice in the total length (without caudal fin); the second spine of the anterior dorsal almost four times in the same length; the third spine of the anal fin smaller and shorter than the second. Lateral line with a rather strongly curved arch beneath the fourth spine of the dorsal fin. Coloration (in spirits) uniform.

Borneo.

a. Adult.

Prof. Peters, of Berlin, has kindly informed me that a specimen of this species, which is apparently undescribed, exists in the Berlin Museum. It was sent by Prof. Schlegel, who gave to it the name of *A. robustus,* and marked it as coming from Borneo. In the Berlin specimen the second anal spine is as long as the head, and one-third of the total length, whilst it is shorter in that in the British Museum Collection.

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* 1. Chanda lata, *Buch. Ham.* p. 114. pl. 21. f. 39; *Cuv. & Val.* ii. p. 184; *Bleek. Verh. Bat. Gen.* xxv. tab. 1. f. 1.—Ganges.
2. Chanda baculis, *Buch. Ham.* p. 112; *Cuv. & Val.* ii. p. 187.—Ganges.
3. Ambassis barlovi, *Sykes, Trans. Zool. Soc.* i. p. 350. t. 60. f. 1 (bad).
4. Priopis argyrozona, (*Kuhl & v. Hass.*) *Cuv. & Val.* vi. p. 503. Known from a drawing only: it may be placed for the present among the doubtful species of *Ambassis,* to which it is allied, though it may be the type of a separate genus.—Java.

† Sir J. Richardson is wrong in describing "both the anterior and the posterior edges of the præopercular limb denticulated." (*Ichthyology*, p. 275.)

2. **Ambassis commersonii.**

Sciæna safgha, *Forsk. Descr. Anim.* p. 53.
Centropomus ambassis, *Lacép.* iv. p. 273.
Lutjanus gymnocephalus, *Lacép.* iv. p. 216, iii. pl. 23. f. 3.
Ambassis commersonii, *Cuv. & Val.* ii. p. 176. pl. 25; *Rüpp. N. W. Fische*, p. 89.
Ambassis nalua, *Bleek. Perc.* p. 30; *Batav.* p. 453.

B. 6. D. $7 \mid \frac{1}{9\text{–}10}$. A. $\frac{3}{9}$. L. lat. 30–33. Vert. 9/15.

The height of the body is $2\frac{1}{2}$ in the total length (without caudal fin); the second spine of the first dorsal is $3\frac{1}{3}$ in the same length. The second and third spines of the analis are equal in size and length, or the third is rather longer; lateral line slightly curved. Coloration of body uniform.

Red Sea; Isle de France; East Indian Seas; Shores of Northern Australia (not yet found in the Chinese Seas).

Cuvier quotes (p. 176) among the synonyma *Chanda nalua*, Buch., which is afterwards (p. 182) described as a separate species.

a. Adult: skeleton. India. From the Haslar Collection.
b, *c*. Half-grown. India.
d. Half-grown: not good state. India.
e, *f*. Half-grown. India. Presented by W. Masters, Esq.
g. Fine specimen. Purchased of Mr. Frank.
h. Half-grown. Amboyna. From Madame Ida Pfeiffer's Collection.
i. Half-grown. Philippines. From Mr. Cuming's Collection.
k. Adult. Java. From Mr. Frank's Collection.
l. Adult. Java.
m. Adult. Port Essington. From the Haslar Collection.
n. Adult. N. Australian Exped. Presented by Dr. J. R. Elsey.
o. Adult. Australia. Presented by the Earl of Derby.

Skeleton.—The skull, compared with that of species of *Apogon*, exhibits the *capsula cerebri*, although rounded, only slightly prominent, forming the base of a very high crest, which, triangular and pointed behind, reaches to the middle of the interspace between the orbits; it is supported by two bony spines, one of which is small, arising from the paroccipital and directed horizontally backwards; the other, much longer and stronger, arises from the middle of the suture between paroccipital and frontals, and passes in an oblique direction to the upper posterior angle of the crest. There is a groove and a ridge between the orbital part of the frontals, as in *Apogon*; the groove is, again, bifid behind, and there is another small elevated ridge along each posterior branch of the groove. The præoperculum exhibits also a double edge, an exterior and an interior; the lower branches of both are serrated in this species, and there is a strong spinous tooth at the angle of the interior edge. The præorbital is strongly serrated. There is no spine, or only a very feeble one, supporting the operculum. The intermaxillary and dentary bones are armed with teeth along their entire length; those of the vomer and of the palatine bones are situated in single series, the former forming an obtuse angle. There are nine abdominal and fifteen caudal vertebræ. According to the rule that the strongest dermoneural or dorsal spines are supported by the strongest interneurals, we find in this species the two anterior interneural bones of the dorsal fin and the two anterior of the anal very strong—the former corresponding to the neural spines (*processus spinosi*) of the second and third abdominal vertebræ, the latter to those of the first and second of the caudal portion.

3. **Ambassis urotænia.**

Bleek. Amb. & Cer. p. 257.

D. $7 \left| \frac{1}{9\text{–}10} \right.$. A. $\frac{3}{9\text{–}10}$.

The height of the body is $2\frac{1}{2}$ in the total length (without caudal fin); the second spine of the first dorsal is $4\frac{1}{2}$ in the same length; the third anal spine longest, shorter than the second of the dorsal fin. Yellowish, with a silvery lateral band; the first dorsal blackish between the second and third spines; each lobe of the caudal fin with a broad blackish longitudinal band. (*Bl.*)

Seas of Amboyna and Wahai.

4. **Ambassis kopsii.**

Bleek. Singapore, ii. p. 253.

B. 6. D. $7 \left| \frac{1}{10\text{–}11} \right.$. A. $\frac{3}{8\text{–}9}$. L. lat. 27–28.

The height of the body is nearly one-half of the total length (without caudal fin). Orbit with a small spine, directed backwards, at the posterior upper angle; suboperculum entire, interoperculum slightly denticulated. Lateral line continuous; the second anal spine rather longer than the third, but shorter than the second of the dorsal fin. Yellowish, body and vertical fins minutely dotted with brown; the spinous dorsal with a rather broad black superior edge. (*Bl.*)

Sea of Singapore.

5. **Ambassis apogonoides.**

Bleeker, Borneo, iv. p. 200.

B. 6. D. $7 \left| \frac{1}{10\text{–}11} \right.$. A. $\frac{3}{9\text{–}10}$. L. lat. 32.

Head pointed, as in *Apogon*. The height of the body is $3\frac{1}{4}$ in the total length (caudal included), the length of the head $3\frac{1}{2}$ in the same length; the diameter of the eye $3\frac{1}{3}$ in the length of the head; the upper profile of the head concave; the upper maxillary bone reaching to below the middle of the eye. Denticulations of the præorbital and præoperculum very small, inconspicuous; the second dorsal spine longest, one-seventh of the total length, and half the height of the body; the first ray of the ventral fin rather elongate; the second and third anal spines nearly equal, almost as long as the second of the dorsal fin. Caudalis deeply forked. Yellowish; the first dorsal blackish at the tip. (*Bl.*)

Rivers of Borneo.

6. Ambassis batjanensis.

Bleeker, Batjan, ii. p. 196.

$$D.\ 7 \Big| \frac{1}{9\text{–}10}.\quad A.\ \frac{3}{9\text{–}10}.\quad L.\ lat.\ 28.\quad L.\ transv.\ \frac{2}{7}.$$

The height of the body is $2\frac{1}{2}$ in the total length (without caudal fin). Præorbital entire; inferior limb and angle of the præoperculum denticulated; the length of the dorsal spine is five times in the total; the third spine of the analis longer than the second. Shining yellowish, with a bluish longitudinal streak; root of the caudal fin more or less violet.

Fresh waters of Batjan; Amboyna.

a. Adult. Amboyna. From Mr. Frank's Collection.

7. Ambassis dussumieri.

Ambassis dussumieri, *Cuv. & Val.* ii. p. 181, vi. p. 503, ix. p. 431; *Bleeker, Perc.* p. 30; *Quoy & Gaim. Voy. Astrol. Poiss.* p. 650. pl. 1. f. 3.

Chanda dussumieri, *Cantor, Catal.* p. 6.

$$D.\ 7 \Big| \frac{1}{9\text{–}10}.\quad A.\ \frac{3}{9}.$$

The height of the body is more than three times in the total length (without caudal fin); the second spine of the first dorsal one-fifth of the same length; the diameter of the eye is nearly one-third of the length of the head; lateral line interrupted. Coloration of body uniform.

Malabar; Sea of Pinang; Javanese and Chinese Seas; Celebes; Amboyna; Isle de France; Seychelles.

a. Half-grown China.
b. Half-grown. China.
c. Half-grown. China.

8. Ambassis thermalis.

Cuv. & Val. iii. p. 493.

$$D.\ 7 \Big| \frac{1}{9}.\quad A.\ \frac{3}{9}.$$

The height of the body is not fully three times in the total length (without caudal fin). Greenish, with a silvery lateral band; on each lobe of the caudal fin a blackish longitudinal streak. (Les écailles sont grandes et fortes.—*Cuv.*)

Warm springs of Cania (Ceylon).

9. Ambassis nalua.

Ambassis nalua, *Cuv. & Val.* ii. p. 182.

Chanda nalua, *Ham. Buch. Gang. Fish.* p. 107. t. 6. f. 36; *Cantor, Catal.* p. 6.

$$\mathrm{D.}\ 7 \,\Big|\, \frac{1}{10\text{–}11}. \quad \mathrm{A.}\ \frac{3}{9\text{–}10}.$$

The height of the body is one-half of the total length (without caudal-fin); the second spine of the first dorsal is one-fourth of the same length; no spinous teeth on the hinder part of the orbit (?); interoperculum entire (?). Coloration of body uniform.

A rather doubtful species.

Javanese Seas; Sea of Pinang; Rivers of Lower Bengal.

10. Ambassis interrupta.

Bleeker, Ceram, ii. p. 696.

$$\mathrm{D.}\ 7 \,\Big|\, \frac{1}{9\text{–}10}. \quad \mathrm{A.}\ \frac{3}{9\text{–}10}. \quad \mathrm{L.\ lat.}\ 28.$$

The height of the body is one-half of the total length (without caudal fin). Above the eye a small spine, directed backwards; orbit denticulated beneath; interoperculum denticulated; the lateral line interrupted beneath the second dorsal fin; the second spine of the first dorsal one-third of the total length (without caudal fin); the third anal spine longest, but much shorter than the second of the dorsal fin. Coloration uniform, with a silvery lateral band; fins yellowish, the interspace between the second and third dorsal spines blackish.

Seas of Batavia and Wahai (Ceram).

11. Ambassis buruensis.

Bleeker, Boeroe, p. 396.

$$\mathrm{D.}\ 7 \,\Big|\, \frac{1}{8\text{–}9}. \quad \mathrm{A.}\ \frac{3}{9\text{–}10}. \quad \mathrm{L.\ lat.}\ 28. \quad \mathrm{L.\ transv.}\ \frac{3\text{–}4}{7\text{–}8}.$$

The height of the body is $2\frac{1}{3}$ in the total length (without caudal fin). Above the eye a small spine, directed backwards; orbit not denticulated beneath; interoperculum with a small spine at the angle; the lateral line interrupted beneath the front end of the second dorsal; the second spine of the first dorsal is $3\frac{1}{2}$ in the total length (without caudal); the third anal spine not much longer than the second, and shorter than the second of the dorsal fin. Coloration uniform, with a silvery lateral band; fins yellowish, the interspace between the second and third dorsal spines blackish. (*Bl.*).—Closely allied to the preceding species.

Rivers of Boeroe.

12. Ambassis wolffii.

Bleeker, Borneo, i. p. 9.

$$\mathrm{D.}\ 7 \,\Big|\, \frac{1}{10}. \quad \mathrm{A.}\ \frac{3}{10}. \quad \mathrm{L.\ lat.}\ 36.$$

The height of the body is rather more than one-half of the total length (without caudal fin); the second dorsal spine is nearly one-fourth of the same length, and equal to the second of the anal fin:

several small spinous teeth above the orbit; interoperculum slightly denticulated. Coloration uniform; the first dorsal above black. (*Bl.*)

Rivers of Borneo.

13. Ambassis vachellii.

Richardson, Ichthyol. China, p. 221.

$$\text{D. } 7 \left| \frac{1}{9} \right. . \quad \text{A. } \frac{3}{9}.$$

The height of the body is $1\frac{1}{2}$ in the total length, without caudal fin (*Rich.* states the length of fish 2·50 inches; height of body 1·68 inch); four teeth, reclining backwards on the hinder part of the orbit.

Sea of Canton.

14. Ambassis macracanthus.

Bleeker, Perc. p. 30, and *Batavia,* p. 455.

$$\text{D. } 7 \left| \frac{1}{9\text{–}10} \right. . \quad \text{A. } \frac{3}{9\text{–}11}. \quad \text{L. lat. } 29.$$

The height of the body is one-half of the total length (without caudal fin); the second spine of the first dorsal is $2\frac{1}{2}$ in the same length. Sub- and interoperculum entire; lateral line continuous; the third anal spine longest. Coloration of body uniform; the interspace between the second and third dorsal spines blackish.

Sea of Batavia.

15. Ambassis macrolepis.

Bogoda macrolepis, *Bleek. Act. Soc. Nederl.* ii., *Borneo,* p. 13.

$$\text{D. } 7 \left| \frac{1}{10} \right. . \quad \text{A. } \frac{3}{10}. \quad \text{L. lat. } 70.$$

Præorbital denticulated; the second anal spine longest, not shorter than the second of the dorsal.

River Kapuas (Borneo).

B. *Species with the anal fin rather elongate* (14–17 rays).

16. Ambassis alta.

Cuv. & Val. ii. p. 183.

$$\text{D. } 7 \left| \frac{1}{14} \right. . \quad \text{A. } \frac{3}{14}.$$

The height of the body is $2\frac{1}{2}$ in the total length (caudal fin included); the second spine of the first dorsal is one-half of the height of body. Both the inferior edges of præoperculum and præorbital beautifully serrated.

Bengal.

a–c. Adult. India. Presented by G. R. Waterhouse, Esq.

d–h. Half-grown. India. Presented by G. R. Waterhouse, Esq.—Body with three darker cross-bands.

17. Ambassis ranga.

Chanda ranga, *Buch. Ham.* p. 113. pl. 16. f. 38.
Ambassis ranga, *Cuv. & Val.* ii. p. 183.

$$\text{D. } 7 \,\Big|\, \tfrac{1}{12}. \quad \text{A. } \tfrac{3}{15}.$$

The height of the body is $2\frac{1}{3}$ in the total length (caudal fin included); the first spine of the second dorsal denticulated.

Mouth of the Ganges.

18. Ambassis oblonga.

Chanda nama, *Buch. Ham. Fish. Gang.* p. 109. pl. 39. f. 39.
—— phula, *Buch. Ham. l. c.* p. 111.
Ambassis nama et phula, *Cuv. & Val.* ii. pp. 185, 186.
—— oblonga, *Cuv. & Val.* ii. p. 185.
Bogoda nama, pt., *Bleeker, Nalez. Ichthyol. Fauna Beng. en Hindost.* p. 89. tab. 1. f. 2.

$$\text{D. } 7 \,\Big|\, \tfrac{1}{15}. \quad \text{A. } \tfrac{3}{14}.$$

The height of the body is one-fourth of the total length (caudal fin included); the second spine of the first dorsal is one-half of the height of the body. Præoperculum and præorbital very slightly serrated. Scales very small.

Fresh waters of Bengal.

a, b. Adult. India. Presented by G. R. Waterhouse, Esq.

19. Ambassis bogoda.

Chanda bogoda, *Buch. Ham.* p. 111.
Ambassis bogoda, *Cuv. & Val.* ii. p. 187.
Bogoda nama, pt., *Bleek. Nalez. Ichthyol. Fauna Beng. en Hindost.* p. 89.

$$\text{D. } 7 \,\Big|\, \tfrac{1}{15}. \quad \text{A. } \tfrac{3}{17}.$$

The height of the body is not fully $2\frac{1}{2}$ in the total length (without caudal fin); the second spine of the first dorsal is $5\frac{1}{2}$ in the same length. Scales very small.

Mouth of the Ganges.

a, b. Half-grown. India. Presented by the East India Company.

43. MICROICHTHYS.

Microichthys, *Rüppell, Verz. der im Mus. Senckenbg. aufgest. Samml. Fische,* p. 1.

Seven branchiostegals. All the teeth villiform, without canines; palatines?*; tongue? Two separate dorsals; anal fin with two spines; an acute ridge from the eye extending backwards over the opercles*. Scales large, deciduous; opercles naked. Lateral line commencing under the first rays of the second dorsal.

Mediterranean.

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* Sir J. Richardson (*Ichthyol.* p. 275) misunderstood a part of Rüppell's description. Rüppell says, "Die Zähne am Gaumen konnten nicht untersucht werden," and "von dem Auge rückwärts über die schuppenlosen Operkeln eine in eine Spitze auslaufende Leiste."

1. Microichthys coccoi.

Rüppell, l. c.

General aspect and the form and position of the fins as in *Ambassis*; lower jaw projecting a little beyond the upper.

Sea of Sicily.

44. APOGON*.

Apogon, *Lacép.* iii. p. 411; *Cuv. & Val.* ii. p. 142.

Seven branchiostegals. All the teeth villiform, without canines; teeth on the palatine bones; tongue smooth. Two separate dorsals, the first with six or seven, the anal fin with two spines. Operculum spiniferous; præoperculum with a double serrated ridge. Scales large, readily deciduous.

From the Red Sea, through all the Seas of the Indian and Australian region, some species entering the fresh waters; one species found on the coast of Brazil.

Synopsis of the Species.

A. Apogon with less than ten soft rays in the anal fin, and

1. with six spines in the first dorsal.

a. Body without longitudinal or transverse bands.

α. With a black blotch on each side of the base of the caudal fin.

1. A. imberbis,
2. A. heptastigma,
3. A. hyalosoma.
4. A. thermalis.

β. Without such a black blotch.

5. A. pœcilopterus,
6. A. godini,
7. A. axillaris,
8. A. hypselonotus,
9. A. leptacànthus,
10. A. nigromaculatus.

b. Body with darker transverse bands or oblong transverse spots.

11. A. orbicularis,
12. A. nematopterus,
13. A. trimaculatus,
14. A. rhodopterus,
15. A. koilomatodon.

c. Body with longitudinal bands.

16. A. margaritophorus,
17. A. tæniatus,
18. A. amboinensis,
19. A. sangiensis,
20. A. ceramensis.

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* 1. Apogon latus, (*Ehrenb.*) *Cuv. & Val.* ii. p. 159.—Red Sea.
2. —— multitæniatus, *Cuv. & Val. l. c.*; *Rüpp. Atl.* p. 47.—Red Sea.
3. —— coccineus, *Rüpp. N. W.* p. 88. t. 22. f. 5.—Red Sea.
4. —— ceylonicus, *Cuv. & Val.* iii. p. 491.
5. —— moluccensis, *Val. Nouv. Ann. Mus. Hist. Nat.* 1832, p. 54.—Amboyna.
6. —— guamensis, *Val. l. c.*—Guam.
7. —— novæ hollandiæ, *Val. l. c.* p. 55. pl. 4. f. 2.—Australia.
8. —— lateralis, *Val. l. c.* p. 58.—Vanicolo.
9. —— novem-fasciatus, *Faun. Japon.* pl. 2. f. 2; A. schlegelii, *Bleek. Verhand. Batav. Genootsch.* xxvi. p. 55.—Japan.
10. —— fuscus, *Quoy & Gaim. Voy. Freyc. Zool.* p. 345.—Guam.

2. With seven spines in the first dorsal.

a. Body without longitudinal or transverse bands.

21. A. nigripinnis,
22. A. tæniopterus,
23. A. monochrous,
24. A. maculosus,
25. A. enneastigma,
26. A. rüppellii,
27. A. novæ guineæ,
28. A. cupreus,
29. A. hoevenii,
30. A. truncatus.

b. Body with darker transverse bands or oblong transverse spots.

31. A. bifasciatus,
32. A. timoriensis,
33. A. bandanensis,
34. A. annularis,
35. A. lineatus.

c. Body with longitudinal bands.

36. A. quadrifasciatus,
37. A. semilineatus,
38. A. chrysopomus,
39. A. kalosoma,
40. A. frenatus,
41. A. kallopterus,
42. A. fasciatus,
43. A. cyanosoma,
44. A. cyanotænia,
45. A. multitæniatus,
46. A. hartzfeldii,
47. A. chrysotænia,
48. A. victoriæ.

3. With eight spines in the first dorsal.

49. A. melas,
50. A. cantoris.

4. With nine spines in the first dorsal.

51. A. meaco.

B. Apogon with more than ten soft rays in the anal fin.

52. A. lineolatus,
53. A. fucatus,
54. A. macropterus,
55. A. bleekeri,
56. A. macropteroides,
57. A. buruensis,
58. A. zosterophorus.

A. Apogon with less than ten soft rays in the anal fin.

1. D. 6. $\Big| \frac{1}{8 \text{ or } 9}$. A. $\frac{2}{7 \text{ or } 8 \text{ (in one species 9)}}$.

a. Body without longitudinal or transverse bands.

1. Apogon imberbis.

Corvulus, *Gesner,* p. 1273.
Mullus imberbis sive Rex mullorum, *Willughby,* p. 286; *Ray,* p. 91.
Trigla, sp. 3, *Artedi, Genera,* p. 43.
Amia, *Gronov. Zooph.* p. 80. pl. 9. f. 2 (omitted in his system).
Mullus imberbis, *Linn. Syst. Nat.* xiii. edit. 1. sp. 1341; *Shaw, Zool.* iv. p. 618.
Apogon ruber, *Lacép.* iii. p. 411; *Risso, Ichth. Nice,* edit. 1. p. 214.
Dipterodon hexacanthus, *Lacép.* iv. p. 167, iii. pl. 4. f. 2.
Centropomus auratus, *Lacép.* iv. p. 273.
—— rubens, *Spinola, Ann. Mus. Hist. Nat.* x. p. 370. pl. 28. f. 2.
Perca pusilla, *De la Roche, Ann. Mus. Hist. Nat.* xiii. p. 318.
Apogon rex mullorum, *Cuv. & Val.* ii. p. 143; *Cuv. Règne Anim. Ill.* pl. 7. f. 2 (not good); *Guichen. Explor. Algér. Poiss.* p. 32.

A black blotch on each side of the tail. Bright red or orange-coloured in life, with minute black points; fins not spotted.

Mediterranean; Madeira.

a. Adult. Europe.
b. Adult: skeleton. Europe.

c–e. Adult. Mediterranean. From Mr. Frank's Collection.
f. Adult. Sicily. Presented by W. Swainson, Esq.
g. Adult: bad state. Madeira. From the Haslar Collection.

Skeleton.—The skull of the species of the genus *Apogon* is distinguished by the hemispherical prominent capsula cerebri, formed by the parietal and occipital bones and by the hinder part of the frontals; the latter part is generally provided with two or more small spinous prominences; the orbital part of the frontals is very developed, not flat, but with a deep narrow groove along the median line; this groove is bifid behind, thus separating the orbital part of the frontals from the posterior. In front of the median groove is a high ridge, generally half as long as the diameter of the eye, and bifid behind; this ridge, together with those spinous prominences of the frontals, is for the purpose of keeping the skin suspended above the grooves. Large mucose cavities are formed thereby, communicating with those of the suborbital arch, &c. The occipital crest is very developed and broad, more or less truncated behind, reaching downwards to the vertebral column, and supported by another, narrower, horizontal one, which arises also from the occipital. Another peculiarity of the skull of *Apogon* is the internal free ridge of the præoperculum, parallel to the external margin. The operculum is always supported by a strong, straight bony ridge, conspicuous from the outside, but prominent only at the inner surface; it arises near the articulation of the operculum with the epitympanic (*os temporale*), and projects sometimes in a small free spine at the hinder angle of the operculum.

In *Apogon imberbis* the lower outer margin only of the præoperculum is very finely denticulated, the teeth becoming smaller at the angle. The vomerine and palatine teeth are arranged in a single row, the series of the former forming a right angle. There are eleven abdominal and fourteen caudal vertebræ.

2. Apogon heptastigma.

Apogon heptastigma, (*Ehrenberg*) *Cuv. & Val.* ii. p. 160.

Two black spots on each side of the tail; brownish red, fins reddish; five black spots at the base of dorsalis.

Red Sea.

3. Apogon hyalosoma.

Apogon thermalis, *Bleeker, Perc.* p. 27 (not *Cuv.*).
—— hyalosoma, *Bleeker, Singapore*, p. 63, and *Amboyna*, iv. p. 329.

Caudalis slightly notched. Uniform yellowish, with a black spot at the root of the caudal fin; interspace between the second and third dorsal spines black. Suprascapula, sub- and interoperculum entire; the upper maxillary bone reaching to below the posterior half of the eye.

Seas of Batavia, Sumbawa, Amboyna, and Sumatra.

a. Adult. Amboyna. From Mr. Frank's Collection.

4. Apogon thermalis.

Cuv. & Val. iii. p. 492 (not *Bleeker*).

A black blotch on each side of the tail. Uniform yellowish; interspace between the second and third spines of the first dorsal fin blackish.

Warm springs of Cania (Ceylon).

The circumstance of this species being found in warm springs makes it probable that it is different from the preceding. The original description, like most of Valenciennes's, is too imperfect to determine specimens by it.

5. Apogon pœcilopterus.

Apogon pœcilopterus, (*Kuhl & van Hasselt*) *Cuv. & Val.* ii. p. 154; *Cantor, Catal.* p. 2.

No black blotch on the tail; sides brown-spotted; a large black spot on the first dorsal fin; the second marbled with brown, and with a brown band at the base. Nine soft rays in the analis.

Javanese Sea.

6. Apogon godini.

Bleeker, Sumatra, iii. p. 496.

No black blotch on the tail; rose-coloured; scales with violet edges; fins not spotted. Thirty-three scales in the lateral line. Caudalis emarginate.

Western coast of Sumatra.

7. Apogon axillaris.

Valenciennes, Nouv. Ann. Mus. Hist. Nat. 1832, p. 56. pl. 4. f. 3.

Reddish, minutely punctulated with blackish; a deep black spot at the base of the pectoral fins, which are punctulated with black. Caudalis slightly notched; præorbital entire; præoperculum with a single edge beneath; analis with seven soft rays.

Ascension Island.

8. Apogon hypselonotus.

Bleeker, Batoe, p. 309.

Uniform greenish. Caudalis deeply forked; suprascapula, sub- and interoperculum entire; the second dorsal spine longest. L. lat. 23–25. L. transv. 9.

Sea of Batoe.

9. Apogon leptacanthus.

Bleeker, Ternate, viii. p. 204.

Coloration uniform. Caudalis notched; the dorsal spines flexible; the second elongate, filiform. L. lat. 24. L. transv. 8–9.

Sea of Ternate.

10. Apogon nigromaculatus.

Hombr. & Jacquin. Voy. au Pôle Sud, Poiss. p. 32. pl. 1. f. 2.

The height of the body is one-half of the total length (without caudal); the præorbital with three or four notches beneath. Spines very long and strong; the second dorsal spine longer than one-half the height of the body. Rose-coloured, with small spots of deep black; fins immaculate.

New Guinea.

b. Body with darker transverse bands or oblong transverse spots.

11. Apogon orbicularis.

Apogon orbicularis, (*Kuhl & van Hasselt*) *Cuv. & Val.* ii. p. 155, vi. p. 495; *Bleek. Amb. & Cer.* p. 254; *Quoy & Gaim. Voy. Astrol. Poiss.* p. 648. pl. 1. f. 4; *Bleek. Act. Soc. Nederl.* i. *Amboina*, p. 28.

A brown zone round the body from the front part of the first dorsal fin to the anus, posteriorly with large, irregular, dark blotches; the first dorsal with small brown spots; in the middle of the tail a black longitudinal band.

Javanese Seas; Ceram.

12. Apogon nematopterus.

Bleek. Act. Soc. Nederl. i., *Manado en Macassar*, p. 35.

A broad, vertical, blackish zone round the body, occupying the whole space beneath the first dorsal fin, posteriorly irregularly spotted with brownish. The first and second rays of the second dorsal produced into filaments.

Sea of Manado.

13. Apogon trimaculatus.

Cuv. & Val. ii. p. 156. pl. 22 (*not Richards. Ichth. China*, p. 221); *Less. Voy. Coq. Zool.* p. 237.

Analis with nine soft rays. Pectoral fins reaching to the middle of the anal fin. Red (in life), with three black transverse spots, forming three half-rings and reaching to the middle of the depth of the body: the first corresponding to the front part of the first dorsal, the second to the second dorsal, and the third to the middle of the back of the tail.

Buru (Moluccas).

Four pyloric appendages. (*Cuv.*)

14. Apogon rhodopterus.

Bleeker, Singapore, p. 62.

Analis with seven or eight soft rays; pectoral fins not reaching to the analis. Greenish, with two transverse bands, the first placed beneath the front part of the first dorsal, the second beneath the posterior part of the second; tail with a round black spot (lateral?); the first dorsal black-edged.

Singapore.

15. Apogon koilomatodon.

Bleeker, Ternate, p. 4.

Præorbital slightly denticulated; the upper maxillary bone reaching to just below the middle of the eye; back and sides with darker spots; two black half-rings encircling the back, the first corresponding to the anterior dorsal fin, the second to the hinder part of the posterior.

Ternate (Moluccas).

c. Body with longitudinal bands.

16. Apogon margaritophorus.

Bleeker, Batjan, p. 363.

Along the back two blackish-violet and two bright red alternate bands; along the middle of the side a broad orange-coloured band with a row of 12 bluish spots; crown with a yellowish-green mark in the shape of a V; on each side of the head four bright red longitudinal bands; fins uniform red.

Batjan.

17. Apogon tæniatus.

Apogon tæniatus, (*Ehrenberg*) *Cuv. & Val.* ii. p. 159; *Rüppell, Atlas Fische,* p. 48, and *N. W. Fische,* p. 87.

Brownish, with five lighter longitudinal lines; above the pectoral fins a round brown spot; a blackish spot at the base of the caudalis; a vertical dark band in the middle of the second dorsal fin.

Djetta (Red Sea).

Cuvier (*l. c.*) gives the number of rays of the dorsal fins $7 \mid \frac{1}{8}$, but Rüppell (*l. c.*) twice states it to be $6 \mid \frac{1}{9}$.

18. Apogon amboinensis.

Bleeker, Amboina, iv. p. 329.

Yellowish (in life), with two brown longitudinal bands, one running from above the eye to the side and curved, the other from the muzzle through the eye to the tail; a round black spot at the root of the caudal fin; fins uniform, the first dorsal blackish in front. Caudalis notched; the upper maxillary bone reaching to behind the middle of the eye; præoperculum with only the posterior margin denticulated; sub- and interoperculum entire; the second spine of the first dorsal longest. L. lat. 24. L. transv. 9.

Rivers of Amboyna.

19. Apogon sangiensis.

Bleeker, Sangi, p. 375.

Shining golden; a broad deep brown band from the muzzle through the eye to the operculum; a round black spot at the root of the caudal fin; anal fin sparingly spotted with blue. Caudalis notched; suprascapula, sub- and interoperculum entire; the third dorsal spine longest. L. lat. 25. L. transv. 9–10.

Sea of Sangi.

20. Apogon ceramensis.

Bleeker, Amb. & Cer. p. 256.

Caudalis notched. Greenish; head sprinkled with darker; a narrow brown streak from the thorax (?) to the tail; a black spot at the root of the caudal fin; the interspace between the second and third dorsal spines black.

Sea of Wahai (Ceram).

2. $D. 7 \Big| \frac{1}{8\text{–}10}.\quad A. \frac{2}{8\text{–}10}.$

a. Body without longitudinal or transverse bands.

21. Apogon nigripinnis.

Cuv. & Val. ii. p. 152; *Faun. Japon. Poiss.* p. 3.

Analis with eight soft rays; the limbs of the præoperculum denticulated; caudalis rounded. The first dorsal black, at least in its upper half; the second dorsal and the anal fin with a black band along the base, sometimes extending over all the fin; the hinder margin of the caudal and the ventral fins black.

Chinese and Japanese Seas.

a. Adult. China. Presented by Capt. Sir E. Belcher.
b, c. Half-grown. China. Presented by Capt. Sir E. Belcher.
d–f. Young: not good state. China. Presented by Capt. Sir E. Belcher.
g–i. Adult: bad state. East Indies. From the Haslar Collection.
k–r. Half-grown specimens. East Indies. From the Haslar Collection.
s. Half-grown. East Indies. From the Haslar Collection.
t–v. Young. East Indies. From the Haslar Collection.

22. Apogon tæniopterus.

Bennett, Proc. Zool. Soc. iii. 1835, p. 206.

Analis with eight soft rays; the limbs and the inner edge of the præoperculum and the orbit denticulated; caudalis notched. The first dorsal with oblique black spots between the spines; the second and the anal fin with a black band along the base; each lobe of the caudal with a blackish streak; the outer margin of the ventral blackish.

Isle de France.

a. Large specimen. Mauritius. Presented by the Zoological Society. (Type of the species.)

23. Apogon monochrous.

Bleeker, Act. Soc. Nederl. i., *Manado en Macassar,* p. 34.

Analis with eight soft rays. Shining golden, minutely dotted with brown; fins sometimes rather darker. Bones of the head not serrated, except the outer margin of the præoperculum and the suprascapula. Caudalis notched.

Seas of Manado, Amboyna, and of the Feejee Islands.

a. Adult. Amboyna. Purchased of Mr. Frank.
b, c. Adult. East Indies. Purchased of Mr. Frank.
d, e. Adult. Feejee Islands. Voyage of H.M.S. Herald.
f–h. Half-grown. Feejee Islands. Voyage of H.M.S. Herald.

24. Apogon maculosus.

Cuv. & Val. vi. p. 494.

Brown: on each side four series of darker spots; fins brown-spotted; head immaculate.

East Indian Seas.

25. Apogon enneastigma.

Rüppell, N. W. Fische, p. 87. t. 22. f. 3.

Reddish, with lighter fins; the first dorsal with a black front edge; above the pectoral a round black, whitish-edged spot; back with five brown specks along the base of the dorsal fins; another black spot on each side of the tail. $D.\ 7 \mid \frac{1}{9\text{–}10}$. $A.\ \frac{2}{8\text{–}9}$.

Massaua (Red Sea).

26. Apogon rüppellii. (Plate XV. fig. B.)

Reddish, with lighter fins; a series of seven blackish dots from the occiput along the base of the dorsals, those beneath the fin not being very conspicuous. A second series of nine dots along, and immediately above the lateral line. There are two or three indistinct dots on the back of the tail. No spot above the base of the pectoral. The first dorsal blackish between the first three spines, the second with some indistinct brownish spots. A brownish streak from the eye to the angle of the præoperculum. Analis with nine or ten rays.

Australian Seas.

a. Adult. Australia. Presented by the Earl of Derby.
b, c. Adult: stuffed. Victoria. Voyage of H.M.S. Herald.

Description.—The height of the body is $3\frac{1}{2}$ to 3 times in the total length, the length of the head $3\frac{1}{3}$ to $3\frac{1}{4}$. The diameter of the eye is about one-third of the length of the head, and much longer than the distance between the eyes; the upper maxillary bone reaches a little behind the vertical from the centre of the eye; the outer edge of the præoperculum is minutely serrated and the angle rounded; the inner edge is entire; operculum with a very short spine. D. $7 \mid \frac{1}{9}$; the third and fourth spines are the longest and equal, about half the height of the body; the spine of the soft dorsal is not much shorter, and the middle rays longer, than the third spine of the first dorsal. Caudalis slightly emarginate, with rounded lobes. A. $\frac{2}{9\text{–}10}$; the second spine is three-quarters of the longest of the dorsal; the pectoral fins reach as far backwards as the ventrals. L. lat. 26. L. transv. $\frac{2}{6}$. All the teeth minute, in narrow villiform bands; that of the vomer rectangularly bent. Length 3 inches 9 lines.

27. **Apogon novæ guineæ.**

? Apogon vinosus, *Cuv. & Val.* vi. p. 494.
Apogon novæ guineæ, *Valenc. Ann. Mus. Hist. Nat.* 1832, p. 53. pl. 4. f. 1; *Bleeker, Natuurk. Tydschr. Nederl. Indie,* vii. p. 316.
—— modestus, *Bleeker, l. c.* p. 315.

Body and fins yellowish, head sprinkled with brown. Caudalis very slightly notched; suprascapula, sub- and interoperculum entire; the upper maxillary bone reaching a little behind the middle of the eye; the fourth dorsal spine longest. L. lat. 24–25. L. transv. 8–9.

Sea of Anjer (Java); Batavia; New Guinea.

a, b. Large specimens: very bad state. India. From the Haslar Collection.
c. Large specimen: very bad state. Norfolk Island. From the Haslar Collection.

28. **Apogon cupreus.**

Apogon cupreus, (*Ehrenberg*) *Cuv. & Val.* ii. p. 159.
? Apogon chrysosoma, *Bleeker, Amb. & Cer.* p. 256.

Caudalis forked. Uniform reddish brown; fins not spotted.

Red Sea.

29. **Apogon hoevenii.**

Bleeker, Amboina, v. p. 483.

Caudalis forked. Red (in life); two obsolete darker streaks below the eye; the first dorsal fin blackish, the interspace between the sixth and seventh spines black.

Amboyna Sea.

30. **Apogon truncatus.**

Bleeker, Java, i. p. 415.

The upper maxillary bone reaching behind the level of the eye;

caudalis very slightly notched. Yellowish, head brown; the upper half of the first dorsal fin black.

Batavia.

b. Body with darker transverse bands or oblong transverse spots.

31. **Apogon bifasciatus.**

Apogon bifasciatus, *Rüppell, N. W. Fische,* p. 86. t. 22. f. 2.
Apogon trimaculatus, (*not Cuv.*) *Richards. Ichthyol. China,* p. 221.

Analis with eight soft rays. Whitish, with two brownish half-rings encircling the back, the first corresponding to the anterior spines of the first dorsal, the second to the last rays of the second; on each side of the base of the caudalis a blackish spot*. (Cfr. *Apogon trimaculatus,* p 233.)

Red Sea; Chinese Seas.

This species has three pyloric appendages.

a. Adult. China. Presented by J. R. Reeves, Esq.
b. Adult. Philippines.
c. Young: bad state. Sine patria.
d. Adult. Red Sea.
e. Adult female: skeleton. Red-Sea.

Skeleton.—The bones of the suborbital arch form an open canal, the edges of which are strongly serrated, with the denticulations directed backwards, except in the præorbital, the edges of which are entire. Both the margins of the præoperculum strongly serrated, the denticulations of the inner ridge being coarser, gradually becoming larger at the angle. The suprascapula, sub- and interoperculum are entire. The vomerine teeth are in a single series, forming a right angle. There are ten abdominal and fourteen caudal vertebræ.

32. **Apogon timoriensis.**

Bleeker, Natuurk. Tydschr. Nederl. Ind. vi. 1854, p. 207.

Suprascapula denticulated. Shining golden, with two broad, brownish-violet transverse bands, the first beneath the spinous dorsal, the second beneath the soft dorsal, triangular, with the point reaching to the base of the anal; the spinous dorsal black at the tip.

Sea of Timor Kupang.

33. **Apogon bandanensis.**

Bleeker, Banda, iii. p. 95.

Suprascapula entire. Brownish, with three broad violet bands, the first corresponding to the anterior dorsal fin, the second to the posterior, and the third to the middle of tail; fins not spotted.

Banda Sea.

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* Rüppell states in this species nine soft rays of the anal fin; but all the specimens in the British Museum Collection, some of which were sent by Dr. Rüppell himself, exhibit eight only.

34. Apogon annularis.

Rüppell, Atlas, p. 48, and *N. W. Fische,* p. 85.

Whitish (in spirits), with a broad zone round the base of the caudal fin.

Var. APOGON ROSEIPINNIS.

Apogon roseipinnis, *Cuv. & Val.* iii. p. 490, vi. p. 553; *Bleek. Amb. and Cer.* p. 253; *Peters, Wiegm. Arch.* 1855, p. 234; *Quoy & Gaim. Voy. Astrol. Poiss.* p. 649. pl. 1. f. 5.

A series of black spots (a violet band in life) along the base of the analis.

Red Sea; Coast of Mozambique; Indian Ocean.

a. Adult female; skeleton. Amboyna. From Mr. Frank's Collection.
b. Adult. Amboyna. From Mr. Frank's Collection.
c. Adult. Amboyna. From Madame Ida Pfeiffer's Collection.
d. Adult. Amboyna. From Mr. Frank's Collection.
e. Adult. Hong Kong. Presented by J. C. Bowring, Esq.

In well-preserved specimens the whole *tractus intestinalis* exhibited a deep black colour, not produced by the contents of the stomach and of the intestines, but by a pigment deposited in all its membranes. There are four pyloric appendages, of the same intense black colour. The other abdominal intestines have the usual colour. The posterior third of the ovarium is united, the two anterior ones separated.

Skeleton.—The very fine, velvet-like vomerine teeth form a rather acute angle; those of the palatine bones are situated in a narrow biserial band. The præorbital bone is rather flat, the others slightly concave, with entire edges: of the edges of the præoperculum only the posterior part of the external margin is minutely serrated. The ridge of the frontal bones is low, the groove not deep, which is in accordance with the less-developed *canaliculi mucosi* of the other parts of the skull in this species. There are ten abdominal and fourteen caudal vertebræ.

35. Apogon lineatus.

Temm. & Schleg. Faun. Japon. Poiss. p. 3; *Bleeker, Verhand. Batav. Genootsch.* xxvi. p. 54. t. 1. f. 1.

Reddish brown (in spirits), with 8–12 very obsolete brownish cross-streaks; no black spot at the base of the caudal fin.

Japanese Sea.

c. Body with longitudinal bands.

36. Apogon quadrifasciatus.

Valenciennes, ii. p. 153; *Bleeker, Perc.* p. 28; *Cantor, Catal.* p. 3; *Peters, Wiegm. Arch.* 1855, p. 234.

Caudalis notched. Whitish (in spirits), on each side two parallel brown longitudinal bands; fins yellowish; the upper half of the anterior dorsal more or less intense black.

Javanese and Chinese Seas; Feejee Islands; Coast of Mozambique.

a. Adult female: skeleton. India. Presented by the Zoological Society.
b. Adult. Feejee Islands. Presented by the Lords of the Admiralty.
c. Adult. China.
d. Half-grown. China. Presented by Capt. Sir E. Belcher.
e. Young: very bad state. Australia. Presented by J. Macgillivray, Esq.
f. Adult. From Mr. Frank's Collection.

Ovaria nearly entirely united, above with two lobes.

Skeleton.—The hinder half of the suborbital arch represents a closed canal; the posterior margin of the præoperculum and the hinder part of the inferior are minutely serrated; suprascapula, sub- and interoperculum entire. There are eleven abdominal and fourteen caudal vertebræ.

37. Apogon semilineatus.

Temm. & Schleg. Faun. Japon. Poiss. p. 4. pl. 2. f. 3 (head of male); *Bleek. Verh. Batav. Genootsch.* xxvi. p. 55. t. 1. f. 2.

Caudalis forked. Brownish; a black longitudinal streak from the muzzle above the eye to the middle of the tail, another from the muzzle through the eye to the point of the operculum. Tip of the first dorsal fin black.

Japanese Sea.

38. Apogon chrysopomus.

Bleeker, Celebes, v. p. 239.

Above violet (in life beneath yellowish); a brown longitudinal band from the forehead above the lateral line to the back of the tail; opercles pearl-coloured, with five or six red spots; a black spot at the root of the caudal fin; fins immaculate; the first dorsal fin blackish above. Caudalis notched; sub- and interoperculum entire; suprascapula denticulated; the third dorsal spine longest. L. lat. 25. L. transv. 8–9.

Sea of Macassar.

39. Apogon kalosoma.

Bleeker, Banka, p. 448.

Reddish yellow, with two brown longitudinal bands, the upper of which is curved towards the back, the lower being straight and united with the former on the tail; there are moreover about fourteen serpentine brown longitudinal stripes on the back and the sides; a round black spot on the root of the caudal fin; the first dorsal fin blackish in front; the second and the anal fin with a black band along the base. L. lat. 36. L. transv. 15. Caudalis notched.

Sea of Banka.

40. **Apogon frenatus.**

Apogon frenatus, *Valenc. Nouv. Ann. Mus. Hist. Nat.* 1832, p. 57. pl. 4. f. 4; *Bleeker, Act. Soc. Nederl.* i., *Amboina,* p. 25.
—— vittiger, *Bennett in Proc. Zool. Soc.* 1833, p. 32.
—— melanorhynchos, *Bleeker, Amb. & Cer.* p. 255, and *l. c.* p. 26.

Reddish brown, with a black longitudinal band from the muzzle along the middle of the side; a black spot on the base of the caudal fin; the first dorsal black in front; the second and the anal with a black longitudinal band at the base; caudal notched.

Mauritius; Ceram; Amboyna; Feejee Islands; Guam; New Guinea.

a. Half-grown. Feejee Islands. Voyage of the Herald.

41. **Apogon kallopterus.**

Bleeker, Act. Soc. Nederl. i., *Manado en Macassar,* p. 33.

Rose-coloured, with a violet shade; a violet band, above and beneath margined with white, from the eye to the caudal fin; a brown band round the muzzle to the eyes; a blackish spot on the base of the caudal fin; the spinous dorsal fin blackish brown, with four subvertical yellow streaks; the soft dorsal with four brown and four pearl-coloured spots, forming two longitudinal series; the anal with a brown band along the base; ventral fins with a white outer margin. L. lat. 26–27. Caudal deeply forked.

Sea of Manado.

42. **Apogon fasciatus.**

Mullus fasciatus, *White, New South Wales,* p. 268. f. 1.
Apogon novem-fasciatus, *Cuv. & Val.* ii. p. 154; *Bleeker, Timor,* i. p. 163; *Peters, Wiegm. Arch.* 1855, p. 234.
—— fasciatus, *Quoy & Gaim. Voy. Freyc. Zool.* p. 344.
—— balinensis, *Bleeker, Perc.* p. 28, *and Verhand. Batav. Genootsch.* xxii., *Bali,* p. 5.
—— aroubiensis, *Hombr. & Jacquin. Voy. au Pôle Sud, Poiss.* p. 31. pl. 1. f. 1.
—— endeka-tænia, *Bleeker, Banka,* p. 449.

Caudalis notched. On each side four or five brown longitudinal bands, and one along the middle of the back; a large round black spot at the root of the caudal fin; the second dorsal and the anal with a blackish band along the base. L. lat. 25–26. L. transv. 8–9.

Feejee Islands; Australian and Molucca Seas; Coast of Mozambique.

a. Adult. India. From the Haslar Collection.
b. Young: very bad state. Amboyna.
c. Adult. Amboyna. From Madame Ida Pfeiffer's Collection.
d–f. Half-grown. Feejee Islands. Presented by the Lords of the Admiralty.
g. Adult: skin. Port Jackson. Presented by F. Strange.
h. Adult: skin. Port Jackson. From Mr. Gould's Collection.
i. Half-grown: not good state. New Holland.

k, l. Adult: skin. Australia. Voyage of H.M.S. Fly.
m. Adult: stuffed. Australia. From Mr. Warwick's Collection.
n. Half-grown. East Indies. From Mr. Frank's Collection.

43. Apogon cyanosoma.

Bleeker, Solor, p. 71.

Blue (in life), with six golden longitudinal bands; fins red, immaculate. Caudalis slightly notched; the upper maxillary bone reaching to behind the middle of the eye; præoperculum with the posterior and inferior edges denticulated; sub- and interoperculum entire. L. lat. 23. L. transv. 8.

Sea of Lawajong (Solor)

44. Apogon cyanotænia.

Bleeker, Solor, p. 71.

Rose-coloured (in life); back with four or five brown longitudinal stripes; sides with two orange-coloured bands; head with blue longitudinal streaks; fins immaculate, a black spot at the root of the caudal fin. Caudalis notched; the upper maxillary bone reaching to behind the middle of the eye; præoperculum with denticulated inferior and posterior margins; sub- and interoperculum entire. L. lat. 25. L. transv. 8–9.

Sea of Lawajong (Solor).

45. Apogon multitæniatus.

Bleeker, Perc. p. 28 (? *Cuv. & Val.* ii. p. 159).

Caudalis notched; purple-coloured (in life), with 10–13 brown longitudinal streaks on each side; fins not spotted.

Bima (Sumbava Island).

46. Apogon hartzfeldii.

Bleeker, Natuurk. Tydschr. Nederl. Indie, iii. 1852, p. 254, and vi. p. 482.

Caudalis slightly notched. Rose-coloured (in life); a large round black blotch on the base of the caudal fin; on each side of the back, near the dorsal line, a light-blue longitudinal band; the second dorsal fin and the analis with a brown band along the base.

Sea of Amboyna.

a. Adult. Amboyna. From Mr. Frank's Collection.

47. Apogon chrysotænia.

Bleeker, Natuurk. Tydschr. Nederl. Indie, 1851, p. 168.

L. lat. 25. L. transv. 9. The third dorsal spine longest. Caudalis notched. Greyish brown, with two deep olive longitudinal bands on the back and three golden ones on the side. The spinous dorsal fin violet, the others red. (*Bleeker.*)

Batavia.

48. **Apogon victoriæ.** (PLATE XV. fig. C.)

Yellowish olive (in a dried state), with four darker longitudinal bands on each side; root of the pectoral deep black; pectoral yellow. All the outer edge of the præoperculum denticulated, the inner entire.

a, b. Adult: dried. Victoria (Australia). Voyage of H.M.S. Herald.

Description.—The height of the body is $3\frac{1}{3}$ in the total length, the length of the head $3\frac{3}{4}$; the diameter of the eye is less than one-third of the length of the head, and much longer than the distance between the eyes. The lower jaw slightly projects beyond the upper; the upper maxillary bone reaches beyond the vertical from the centre of the eye; the outer margin of the præoperculum is finely serrated posteriorly and inferiorly, the interior ridge being entire. D. $7 \mid \frac{1}{9}$; the first spine is minute; the second rather longer than one-half of the third; the third is very strong, and about $1\frac{1}{4}$ in the length of the head. The spine of the second dorsal fin is not much shorter than the soft portion, one-half the length of the head. Caudalis notched. A. $\frac{2}{8}$; the second spine is rather shorter than that of the soft dorsal; the pectoral reaches slightly beyond the origin of the anal fin; the ventral spine is very strong, compressed, and equal to the second of the anal fin. L. lat. 24. L. transv. 2/6–7. The present colour is a yellowish olive, with four darker, rather indistinct bands, broader than the interspaces of the ground-colour between: the first from the nape, above the lateral line, along the back of the tail; the second from the eye to the middle of the root of the caudal fin; the third from the axil along the lower side of the tail; the fourth on the side of the belly. The pectoral is yellow, with the basal part deep black; the other fins without distinct colour.

	inches.	lines.
Total length	3	9
Height of the body	1	$1\frac{1}{2}$
Length of the head	1	0
Diameter of the eye	0	$4\frac{1}{3}$
Length of the third dorsal spine	0	$9\frac{1}{2}$
——— of the second anal spine	0	$5\frac{1}{2}$

3. With eight spines in the first dorsal.

49. **Apogon melas.**

Bleeker, Perc. p. 29, and *Act. Soc. Nederl.* i., *Amboina,* p. 27.

Caudalis notched. Entirely uniform brownish black; the second dorsal fin with a large round blue spot in the middle of the base.

Bima (Sumbava Island); Celebes; Amboyna.

50. **Apogon cantoris.**

Bleeker, Riouw, p. 479.

L. lat. 24. L. transv. 9. Caudal fin slightly notched. Greenish, punctulated with brown, with two indistinct brownish cross-bands; a black spot at the middle of the base of the soft dorsal fin.

Riouw.

4. With nine spines in the first dorsal.

51. Apogon meaco.

Sparus meaco, *Lacép.* iv. pp. 54 & 160.
Apogon meaco, *Cuv. & Val.* ii. p. 161.

Caudal fin rounded; six white bands and a brown spot on the tail; fins brown-spotted.

Hab. ——?

B. Apogon with more than ten soft rays in the analis. (The first dorsal fin with six spines.)

52. Apogon lineolatus.

Renard, fol. 40. p. 204.
Apogon lineolatus, (*Ehrenb.*) *Cuv. & Val.* ii. p. 160; *Rüppell, Atlas, Fische*, p. 47. t. 12. f. 1, and *N. W. Fische*, p. 85.

Anal with fourteen soft rays; whitish (in spirits), with twelve blackish transverse lines; a black blotch on the tail.

Red Sea.

53. Apogon fucatus.

Cantor, Catal. p. 4.

Anal with sixteen soft rays; caudal slightly forked. The upper maxillary bone nearly reaching to the front of the anterior margin of the orbit. The lower part of the front edge of the second dorsal spine is armed with three blunt teeth, vertically situated; the second, third and fourth spines are of nearly equal length. From the lower part of the orbit to the muzzle a gamboge oblique line; at the base of the caudal a large round black spot; fins not spotted. (*Cant.*)

Sea of Pinang.

Cantor states that this species has no pyloric appendages.

54. Apogon macropterus.

Apogon macropterus, (*Kuhl & van Hasselt*) *Cuv. & Val.* ii. p. 160.
? Apogon ceylonicus, *Cuv. & Val.* iii. p. 491.

Anal with thirteen soft rays. Whitish (in spirits); on each scale a vertical line, formed by minute brown points; fins not spotted. (*Cuv.*)

Javanese Sea.

It will be difficult to determine specimens belonging to this species, the description of Cuvier being very imperfect. But the following species, referred by Bleeker to *A. macropterus*, appears to be distinct, as Bleeker himself supposes. His specimens exhibit a black spot at the root of the caudal fin, which is not mentioned by Cuvier; and at least one additional soft ray in the anal fin.

55. Apogon bleekeri.

Apogon macropterus, *Bleeker, Natuurk. Tydschr. Nederl. Indie,* 1851, p. 168.

? Apogon argenteus, *Valenc. Nouv. Ann. Mus. Hist. Nat.* 1832, p. 60.

Anal with fourteen to seventeen soft rays; caudal slightly forked; the upper maxillary bone reaching to below the middle of the eye. L. lat. 23. The second dorsal spine longest, the first not much shorter. Uniform yellowish; a round black spot at the root of the caudal fin.

Batavia; Padang; Amboyna.

a. Half-grown: not good state. Amboyna. From Mr. Frank's Collection.

56. Apogon macropteroides.

Bleeker, Banka, ii. p. 724.

Anal with sixteen or seventeen soft rays; caudal notched; the upper maxillary bone reaching to below the middle of the eye. L. lat. 23. The second dorsal spine longest, nearly twice as long as the first. Reddish yellow (in life), with about twenty-three red transverse streaks; head and body punctulated with brown, the points on the sides of the head larger; at the root of the caudal fin the points are crowded, and form a blackish spot; fins immaculate.

Sea of Lepar.

57. Apogon buruensis.

Bleeker, Boeroe, p. 394.

Caudal forked; anal with twelve or thirteen soft rays; the second and third dorsal spines longest. Yellowish, shining golden, with two brown longitudinal bands; a blackish spot at the root of the caudal fin. (*Bl.*)

Sea of Boeroe.

58. Apogon zosterophorus.

Bleeker, Act. Soc. Nederl. i., *Manado en Macassar,* p. 36.

Caudal notched; anal with fifteen soft rays. Shining golden; a broad brownish band obliquely descending forwards from the whole base of the second dorsal to the belly; a blackish band round the snout to the eyes; a black spot at the root of the caudal fin.

Sea of Manado.

45. APOGONICHTHYS.

Apogonichthys, *Bleeker, Floris,* p. 321, and *Verhand. Batav. Genootsch.* xxvi. p. 56.

Closely allied to *Apogon*. Seven branchiostegals. All the teeth villiform, without canines; teeth on the palatine bones; tongue smooth. Two separate dorsals, the first with six or seven, the anal fin with two spines. Operculum spiniferous; præoperculum with a double ridge, but both entire. Scales large, readily deciduous.

From the Red Sea through the seas of the Indian and Australian region. [Sea of Bahia.]

1. Apogonichthys gracilis.

Bleeker, Ternate, vii. p. 371.

Caudal notched; anal with eleven or twelve soft rays; the first dorsal spine longest. Shining golden, with a brown streak from the muzzle through the eye to the operculum; root of the caudal fin with a brown spot; each lobe of the caudal with a brown longitudinal band.

Sea of Ternate.

2. Apogonichthys auritus.

Apogon auritus, *Cuv. & Val.* vii. p. 443.
—— punctulatus, *Rüppell, N. W. Fische,* p. 88. t. 22. f. 4 (not *Bleek.*).
? Apogon variegatus, *Valenc. Nouv. Ann. Mus.* i. p. 55.

Caudal truncated. Uniform brown; a round, black, white-edged spot on the operculum. L. lat. 20. L. transv. 7–8.

Isle de France; Red Sea.

3. Apogonichthys polystigma.

Apogon punctulatus, *Bleeker, Nat. Tydschr. Nederl. Indie,* iii. p. 696 (not *Rüpp.*).
Apogonichthys polystigma, *Bleeker, l. c.* vi. p. 484.

Brownish, fins red; operculum with a large blue, lighter-edged spot below; two oblique brown bands from the eye to the præoperculum; each scale with a blackish spot at the base. The upper maxillary bone reaching a little beyond the posterior margin of the eye; the second and third dorsal spines longest. L. lat. 26. L. transv. 9–10.

Sea of Ceram; Sumatra.

4. Apogonichthys amblyuropterus.

Apogon amblyuropterus, *Bleeker, Ceram,* ii. p. 695.

None of the opercular bones denticulated; caudalis rounded. Red (in life), sparingly sprinkled with brown; the first dorsal and the ventral fins nearly entirely brown, the others yellow; the second dorsal and the anal with three red longitudinal bands, the caudal with three undulated red cross-bands. L. lat. 20. L. transv. 8.

Sea of Wahai (Ceram).

5. Apogonichthys glaga.

Apogon glaga, *Bleeker, Perc.* p. 29.
Apogonichthys glaga, *Bleek. Verh. Batav. Genootsch.* xxvi. p. 57.

Rose-coloured (in life), head minutely dotted with brown; the spinous dorsal violet-black in its upper half, the soft dorsal with light blue spots and a broad blackish upper edge; caudal fin black-edged. Seven spines in the first dorsal. Caudalis truncated, with rounded angles. L. lat. 23. L. transv. 8–9.

Javanese and Japanese Seas; Singapore.

6. Apogonichthys carinatus.

Apogon carinatus, *Cuv. & Val.* ii. p. 157; *Faun. Japon. Poiss.* p. 3.
Apogonichthys carinatus, *Bleeker, Floris,* p. 321, and *Verh. Batav. Genootsch.* xxvi. p. 56. pl. 1. f. 3.

Ten soft rays in the anal fin; uniform whitish (in spirits); the four hinder rays of the second dorsal black.

Japanese and Chinese Seas.

7. Apogonichthys perdix.

Bleeker, Floris, p. 321.

Orange-coloured in life, marbled with brownish; cheeks and opercles brown; the first dorsal fin violet, the other fins orange, with all the rays brown-spotted. Caudalis rounded; the third and fourth dorsal spines longest. L. lat. 20. L. transv. 8–9.

Sea of Floris.

8. Apogonichthys aprion.

Apogon aprion, *Richards. Ann. Nat. Hist.* 1842, vol. ix. p. 16.

Caudal rounded. The first dorsal with six spines*; præoperculum not serrated; a small cluster of teeth on the tongue. L. lat. 40. L. transv. 5/13. Brownish, with about eight blackish cross-bands on the back; top of the first dorsal deep black.

Coasts of North Australia.

a. Adult. Port Essington. Presented by J. Gould, Esq.
b. Adult: stuffed. Port Essington. Presented by J. Gould. Esq.
c. Adult: stuffed. Australia.
d. Adult: skin. Port Essington. From Mr. Gilbert's Collection.
e. Adult: skin. King's River, near Victoria (Port Essington).

9. Apogonichthys americanus.

Apogon americanum, *Castelnau, Anim. nouv. ou rares Amér. du Sud, Poiss.* p. 3. pl. 3. f. 2.

Caudalis forked; analis with eight soft rays. Uniform reddish olive. (*Casteln.*)

Coast of Bahia.

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* The number five, stated by Dr. Richardson, is anomalous in one of the specimens; the others have six.

I refer this fish for the present to *Apogonichthys*, as there is no mention of a serrature of the præoperculum in the description. The figure also exhibits an entire limb of this bone.

46. CHILODIPTERUS.

Cheilodipterus, *Lacép.* iii. p. 539; *Cuv. & Val.* ii. p. 162.

Seven branchiostegals. Villiform teeth with the addition of canines, generally in both jaws; teeth on the palatine bones. Two dorsals, separated by an interspace, the first with six, the anal fin with two spines. Operculum without points, præoperculum with an interior ridge and generally with double serrature. Scales large, deciduous.

From the Red Sea through the Indian Ocean into the Pacific.

1. Chilodipterus octovittatus.

Cheilodipterus lineatus, *Lacép.* iii. p. 543. pl. 34. f. 1.
Centropomus macrodon, *Lacép.* iv. p. 273.
Cheilodipterus octovittatus, *Cuv. & Val.* ii. p. 163.
—— heptazona, *Bleek. Perc.* p. 29.

Caudalis notched. Whitish, with eight black longitudinal bands on each side; a black blotch on each side of the base of the caudal fin.

Red Sea; Indian Ocean.

a. Adult. Mauritius. From the Collection of the Zoological Society.
b. Adult. Amboyna. From Mr. Frank's Collection.
c. Adult. India. Presented by the Zoological Society.

2. Chilodipterus lineatus.

Perca lineata, *Forskal, Descript. Anim.* p. 42. no. 43; *Rüpp. N. W. Fische*, p. 89.
—— arabica, *Linn. Syst. Nat.* i. p. 1312.
Centropomus arabicus, *Lacép.* iv. pp. 250, 255.
Cheilodipterus arabicus, *Cuv. & Val.* ii. p. 165. pl. 23.

Caudalis notched. On each side 14–16 black longitudinal lines; a black blotch on each side of the base of the caudal fin.

Red Sea.

a. Adult. Red Sea.
b. Adult. Madagascar. Presented by Dr. J. E. Gray.

3. Chilodipterus quinquelineatus.

Cheilodipterus quinquelineatus, *Cuv. & Val.* ii. p. 167; *Rüpp. N. W. Fische*, p. 89; *Lesson, Zool. Voy. Duperr.* ii. p. 237; *Bleeker, Amb. & Cer.* p. 252.
Apogon novemstriatus, *Rüpp. N. W. Fische*, p. 85. t. 22. f. 1.

Caudalis notched, with ten black longitudinal bands—four on each side, one along the middle of back, and one on the belly; a black spot on the tail with yellow centre; the first dorsal fin black in front.

Society Islands; Amboyna; Red Sea.

a. Half-grown. Amboyna. From Mr. Frank's Collection.

4. Chilodipterus apogonoides.

Bleeker, Act. Soc. Nederl. i., *Manado en Macassar,* p. 37.

Caudalis forked. The interior ridge of the præoperculum not serrated; an outer series of larger teeth in the upper jaw, two small canines in the lower. Rose-coloured; a brownish band round the muzzle; top of the spinous dorsal blackish. (*Bl.*)

Sea of Manado.

5. Chilodipterus amblyuropterus.

Bleeker, Boeroe, p. 395.

Caudalis rounded; sub- and interoperculum entire; with numerous blackish longitudinal streaks; fins immaculate. (*Bl.*)

Sea of Boeroe.

47. SCOMBROPS.

Scombrops, *Temm. & Schleg. Faun. Japon.* p. 118.

Eye large. Seven branchiostegals; in the upper jaw two long canine teeth, in the lower a series of canine-like teeth; teeth on the palatine bones. Two dorsals, the first with eight, the anal fin with three spines. No denticulations on the bones of the skull; operculum with two very feeble points. Scales moderate, very thin, smooth. Pancreatic cæca in increased number.

Japanese Sea.

1. Scombrops chilodipteroides.

Scombrops, sp., *Temm. & Schleg. l. c.* pl. 63. f. 2.
—— cheilodipteroides, *Bleek. Verhand. Bat. Genootsch.* xxv. *Jap.* p. 9, and xxvi. *Jap.* p. 58.

D. $8 \mid \frac{2}{13}$. A. $\frac{3}{12}$. L. lat. 55–60. L. transv. $\frac{5\text{–}6}{12\text{–}14}$. Cæc. pylor. 15.

Spines of the fins very feeble; lower jaw longest; caudalis forked; coloration uniform.

Japanese Sea.

a. Japan.

48. POMATOMUS.

Pomatomus, (not *Lacép.*) *Risso, Ichthyol. Nice,* p. 387; *Cuv. & Val.* ii. p. 171.

Eye very large. Seven branchiostegals. All the teeth villiform.

without canines; no teeth on the palatine bones. Two dorsals, separated by an interspace, the first with seven, the anal fin with two spines. No denticulations on the edges of the bones of the skull; operculum with two very feeble points, præoperculum with prominent rounded and striated angle. Scales moderate, slightly adherent. Pancreatic cæca in considerable number.

Mediterranean.

1. **Pomatomus telescopium.**

Risso, Ichthyol. Nice, p. 301. pl. 9. f. 31; *Cuv. & Val.* ii. p. 171. pl. 24, vi. p. 495; *Lowe, Trans. Zool. Soc.* ii. p. 173; *Guichen. Explor. Scient. Algér. Poiss.* p. 32; *Barker-Webb & Berthel. Hist. Nat. Iles Canar. Ichthyol.* pl. 1.

D. 7 | $\frac{1}{10}$. A. $\frac{2}{9}$. L. lat. 40. Cæc. pylor. 22.

Height of the body rather more than one-fourth of the total length; eye very large, one-third of the length of the head; caudalis forked. Coloration uniform.

Mediterranean; Canarian Islands.

a. Young. Sicily.

49. ACROPOMA.

Acropoma, *Temm. & Schleg. Faun. Japon. Poiss.* p. 31.

Seven branchiostegals. Teeth villiform, with canines in both the jaws; teeth on the palatine bones. Two dorsals, the first with seven (eight) spines, the anal fin with three. Operculum produced into a long denticulated point, præoperculum entire. Anus nearer the root of the ventrals than the origin of the anal. Scales moderate, deciduous, minutely ciliated.

Japanese Sea.

1. **Acropoma japonicum.**

Acropoma, sp., *Temm. & Schleg. l. c.* pl. 12. f. 2, 3.

D. 7 (8) | $\frac{1}{10}$. A. $\frac{3}{7}$.

Spines of the fins slender; lower jaw longest; caudalis forked. Coloration uniform.

Japanese Sea.

Sixth Group. GRYSTINA.

50. OLIGORUS*

Grystes, sp., *Cuv. & Val.* iii. p. 58.

Seven branchiostegals. All the teeth villiform, without canines; teeth on the palatine bones; tongue smooth. One dorsal, with eleven spines, the anal fin with three. Operculum with one point, præoperculum with a single smooth or obtusely denticulated ridge. Scales small. The number of the pyloric appendages small (3).

Rivers of Australia.

1. Oligorus macquariensis.

Grystes brisbanii, *Less. Voy. Coq. Zool.* ii. p. 227.
Grystes macquariensis, *Cuv. & Val.* iii. p. 58; *Richards. Ereb. & Terr. Fishes*, p. 118. pl. 53. f. 8, 9.
—— peelii, *Mitchell, Exped. Austr.* pl. 6. f. 1.

B. 7. D. $\frac{11}{14}$. A. $\frac{3}{12}$. Cæc. pylor. 3.

The height of the body is $4\frac{3}{4}$ in the total length, the length of the head $3\frac{1}{2}$; the diameter of the eye is one-seventh of the latter. Præoperculum, suprascapula, and præorbital entire; operculum with one small spine. Pectoral and ventral fins short, caudalis rounded; the fifth dorsal spine longest; the second and third of the anal nearly equal in length. Brownish grey, with irregular darker spots.

Rivers of Australia.

a, b. Adult: stuffed. Australia. Presented by the Earl of Derby.

2. Oligorus gigas.

Centropristis gigas, *Owen, Osteol. Catal.* i. p. 51.

B. 7. D. $\frac{11}{12}$. A. $\frac{3}{8}$. Vert. 13/14.

Præoperculum obtusely serrated.

New Zealand.

This species, established by Prof. Owen from a skeleton in the Collection of the College of Surgeons, can scarcely be referred to *Centropristis*, even if that genus be technically taken in the extent of the characters given by Cuvier, because there are no canine teeth at all. Cuvier combined very heterogeneous fishes in that genus, and, inconsistently enough, separated many others which exhibit all its characters. At present it is quite impossible to retain it with the definition of Cuvier. The skeleton of the fish in question much resembles that of some species of *Serranus*; but we cannot, on account of the absence of the canine teeth, refer it to that genus. Therefore, although not having a skeleton of *Oligorus macquariensis*, I think it nevertheless best to combine both fishes, on account of the similarity in the structure of their teeth, of their branchiostegals, and of their fins, as well as in their general habit, size, and native country.

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* ὀλίγος, few, and ὦρος, guard; formed according to pylorus, from πύλη, gate, and ὦρος s. οὖρος.

51. GRYSTES*.

Grystes, sp., *Cuv. & Val.* iii. p. 54.

Six or seven branchiostegals. All the teeth villiform, without canines; teeth on the palatine bones; tongue smooth. One dorsal, with ten spines, the anal fin with three. Operculum with two points, præoperculum with a single smooth-edged ridge. Scales moderate. The number of the pyloric appendages increased. Air-bladder simple, slightly notched behind.

Rivers of the United States.

1. Grystes salmonoides.

Labrus salmoides, *Lacép.* iv. pp. 716, 717. pl. 5. f. 2.
Cichla variabilis, *Lesueur, Journ. Acad. Nat. Sc. Philad.*
Grystes salmoides, *Cuv. & Val.* iii. p. 54. pl. 45; *Règne Anim. Ill. Poiss.* pl. 9 *a.* f. 2; *Dekay, New York Fauna, Fishes*, pl. 69. f. 223 (cop.); *Holbr. Ichth. S. Carol.* p. 25. pl. 4. f. 2 (dorsal wrong).
Micropterus, *Cuv. & Val.* v. p. 9 (founded on a mutilated specimen).

B. 6–7. D. $\genfrac{}{}{0pt}{}{10}{13\text{–}14}$ A. $\frac{3}{11\text{–}12}$. L. lat. 90. Cæc. pylor. 14 and more.

The height of the body is nearly one-fourth of the total length, the length of the head is contained $3\frac{1}{2}$ therein. Lower jaw prominent. Præoperculum and suprascapula entire, operculum with two spines; præorbital without or with some slight denticulations; pectoral and ventral fins short; the fourth dorsal spine longest; the second of the anal much shorter than the third; caudalis slightly notched. Uniform greenish brown, with a black spot at the posterior angle of the operculum. *Young* with many indistinct longitudinal streaks.

Fresh waters of the United States.

a–h. Adult and half-grown: skins. Lake Erie. From Dr. Parnell's Collection.

52. ARRIPIS.

Centropristes, sp., *Cuv. & Val.* iii. p. 50, vii. p. 451; *Richardson, Voy. Ereb. & Terr. Fishes*, pp. 29, 117.
Arripis, *Jenyns, Zool. Beagle, Fishes*, p. 14.
Homodon, *Brisout de Barneville, Rev. Zool.* 1847, p. 133.

Seven branchiostegals. All the teeth card-like or villiform, without any canines; teeth on the palatine bones; tongue smooth. One dorsal, with nine slender spines; the anal fin with three. Operculum spiniferous; præoperculum denticulated. Scales moderate. Number of the pyloric appendages increased (17–50)

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* 1. Grystes nuecensis, *Baird & Girard, Proc. Acad. Nat. Sc. Philad.* 1854, p. 25.
2. Grystes fasciatus, *Eoff in Ninth Smithson. Report*, p. 289.—Ohio.

Seas of the Australian region.

1. Arripis georgianus.

Centropristes georgianus, *Cuv. & Val.* vii. p. 451; *Richardson, Ereb. & Terr. Fishes,* p. 117. pl. 54. f. 3–6.
Arripis georgianus, *Jenyns, Zool. Beagle,* p. 14.

D. $\frac{9}{14}$. A. $\frac{3}{10}$. L. lat. 55. Cæc. pylor. 17.

The height of the body is $4\frac{1}{2}$ in the total length, and the length of the head nearly four times; the diameter of the eye is one-third of the length of the head; præoperculum finely serrated, operculum with two spines. The fourth dorsal spine longest. In a dried state greenish or yellowish olive, each scale punctulated with darker in the centre or at the edges.

South-eastern and south-western coasts of Australia; Norfolk Island; Port Jackson; King George's Sound.

a–c. Adult: skins. Holdfast Bay; South Australia.
d. Adult: skin: not good state. Houtman's Abrolhos.—'Herring' of the Colonists.
e, f. Half-grown: skins: not in a good state. Hobson's Bay; Port Philip. Voyage of H.M.S. Fly.
g. Adult: skin. Port Jackson. Presented by Mr. J. Strange.
h. Half-grown: skin: not in a good state. Port Jackson. From Mr. Gould's Collection.

2. Arripis salar.

Centropristes salar, *Richardson, Zool. Trans.* iii. p. 78, and *Voy. Zool. Ereb. & Terr. Fishes,* p. 29. pl. 20. f. 4–6.
—— tasmanicus, *Hombr. & Jacq. in Dumont d'Urville, Voy. au Pôle Sud, Poiss.* p. 40. pl. 4. f. 1.

D. $\frac{9}{16-17}$. A. $\frac{3}{10}$. L. lat. 48–52. L. transv. 6/12. Cæc. pylor. ca 50. Vert. 10/15.

The height of the body is one-fourth of the total length, and equal to the length of the head; the diameter of the eye is one-fifth of the latter. Præoperculum serrated behind and beneath; sub- and interoperculum with scales. The fourth dorsal spine longest; the third of the anal rather longer than the second. Back with darker spots.

Bay of Islands (New Zealand); Port Arthur (Van Diemen's Land); Australia; Raoul Island; Norfolk Islands.

a. Fine specimen. Raoul Island. Presented by the Lords of the Admiralty.

b–d. Half-grown. Norfolk Island. From the Haslar Collection.
e. Adult male: skeleton. Australia. From the Haslar Collection.
f–h. Adult: bad state. Australia. From the Haslar Collection.
i. Half-grown. Australia. Presented by J. B. Jukes, Esq.
k. Adult: stuffed. Australia.
l. Adult: not good state. Australia. Presented by Sir J. Richardson.
m. Half-grown. Australia. Presented by the Earl of Derby.
n–q. Adult: not good state. Port Arthur. From the Haslar Collection.
r. Adult: not good state. Port Arthur. From the Haslar Collection.
s–w. Adult: very bad state. Port Arthur. Presented by Sir John Richardson.

The swim-bladder is simple, provided with thin membranes; testiculi two and separate; pseudobranchiæ large.

Skeleton.—The upper surface of the skull is broad, flat, rather depressed in the middle; the occipital crest is feeble, and does not extend on to the upper surface of the skull; one low, thin and muciferous ridge passes from the orbit to the upper end of the præoperculum. Præorbital very small, triangular, with spinous teeth at the lower margin. Suborbital arch narrow, with a concave plate at the inner side for supporting the eyeball; upper maxillary with a rather slender basal style, and widening behind; there is an additional bone situated along its upper margin. There is no free space between the articulary and dentary bone. The operculum terminates behind in two very feeble, flat, thin points, separated from each other by a notch; the upper is shorter and rounded. The præoperculum is striated, each stria terminating in a fine tooth; the serrature extends over both the limbs, and is coarser beneath; the sub- and interoperculum have the margins entire and rounded; suprascapula scarcely and very indistinctly denticulated, humeral entire; the lower coracoid styliform. There is no free space between both halves of the pubic bone.

The length of the abdominal vertebral column is to that of the caudal as 12 : 19; the ribs are rather long and slender; the first interhæmal is compressed, feeble and flexible, and attached to the hæmals of the twelfth, thirteenth, and fourteenth vertebræ.

The teeth, being rather strong and separate, form a card-like band in the upper jaw. The others are villiform, and reach, in both the jaws, to the extremities of the bones. The group of the vomerine teeth forms nearly an isosceles triangle; palatine band rather broad; those of the pharyngo-branchial villiform.

3. **Arripis truttaceus.**

? Perca trutta, *Cuv. & Val.* ii. p. 54.
Centropristes (?) truttaceus, *Cuv. & Val.* iii. p. 50.

$$D. \frac{9}{18}. \quad A. \frac{3}{9}.$$

The height of the body is one-fourth of the total length, and equal to the length of the head; the diameter of the eye is one-sixth of the latter. Denticulations of the præoperculum visible on the inferior limb only; operculum with two feeble spines; sub- and interoperculum without scales. The fourth dorsal spine longest. Coloration uniform. (*Cuv.*)

Port Western (New Holland).

53. HURO.

Huro, *Cuv. & Val.* ii. p. 124; *Richards. Faun. Bor. Amer. Fishes*, p. 4.

Six branchiostegals. All the teeth villiform, without canines; palatine bones?; tongue? Two dorsals, the first with six, the anal fin with three spines. No denticulations on the bones of the head; operculum with two flat obtuse points. Scales moderate.

Lake Huron.

1. Huro nigricans.

Cuv. Règne Anim.; *Cuv. & Val.* ii. p. 124. pl. 17; *Richards. Faun. Bor. Amer. Fishes*, p. 4; *Dekay, New York Fauna, Fishes*, p. 15. pl. 69. f. 224 (cop.).

D. 6 | $\frac{2}{10?}$. A. $\frac{3}{11}$. L. lat. 60–65.

Height of the body equal to one-third of the total length, excluding the caudal; cleft of the mouth obliquely running upwards towards the plane of the forehead. Caudal slightly notched. Coloration uniform.

Lake Huron. (Black Bass.)

54. PERCILIA.

Percilia, *Girard, Proc. Acad. Nat. Sc. Philad.* vii. 1854, p. 197, and *U.S. Naval Astron. Exped. to the Southern Hemisph. Zool.* p. 235.

Five or six branchiostegals. Maxillary teeth small, conical, without canines; palatine teeth none. Two dorsals, united at the base only; the first with nine spines, the anal with three. Operculum without any spines; a few minute spines along the limb of the præoperculum. Scales moderate.

Rio de Maypu.

1. Percilia gillissii.

Girard, l. c. pl. 29. f. 5–9.

D. 9 | 11. A. $\frac{3}{8}$. L. lat. 35.

Snout short and rounded; the upper maxillary reaching to the vertical from the anterior margin of the eye. Light reddish or reddish brown, maculated with black. (*Gir.*)

Rio de Maypu.

55. CENTRARCHUS *.

Centrarchus, *Cuv. Règne Anim.*; *Cuv. & Val.* iii. p. 84.
Pomoxis, (*Rafin.*) *Holbr. Ichth. S. Carol.* p. 36.

Six branchiostegals. All the teeth villiform, without canines; teeth on the palatine bones and on the tongue. One dorsal; the anal fin generally with more than three spines. Operculum with two flat points, præoperculum entire or scarcely denticulated. Scales moderate. Air-bladder notched behind. Pyloric appendages in moderate number.

Fresh waters of the Nearctic region; one species from Cuba.

1. Centrarchus æneus.

Cichla ænea, *Le Sueur, Journ. Ac. Nat. Sc. Philad.* 1822, p. 214. pl. 12; *Kirtland, Zool. Ohio*, pp. 168, 191.
Centrarchus æneus, *Cuv. & Val.* iii. p. 84; *Richards. Faun. Bor. Amer. Fish.* p. 18. pl. 75; *Kirtland, Bost. Journ.* iv. p. 239. pl. 11; f. 1; ? *Dekay, New York Fauna, Fishes*, p. 27. pl. 2. f. 4.
Centrarchus pentacanthus, *Cuv. & Val.* iii. p. 88.

D. $\frac{10-11}{10-11}$. A. $\frac{5-6}{10-11}$. L. lat. 39–40. L. transv. 19–20. Vert. 14/18. Cæc. pylor. 7.

The height of the body is $2\frac{3}{4}$ in the total length, and more than the length of the head; the diameter of the eye is one-fourth of the latter, and rather shorter than the distance between the eyes. Præoperculum and præorbital serrated. Caudalis truncated. Greyish brown, each scale with a dark centre; vertical fins variegated with dark brown; a black spot above the angle of the operculum.

Lakes of North America.

a–c. Adult: skins. Lake Erie. From Dr. Parnell's Collection.

2. Centrarchus pomotis.

Baird, in the Ninth Smithson. Report, p. 325.

D. $\frac{11}{12}$. A. $\frac{5}{10}$. L. transv. 6/12.

Snout very short, lower jaw longest; the maxillary bone reaching to the posterior margin of the eye. The length of the head is $3\frac{1}{2}$ in the total, the diameter of the eye one-fourth of the former. Caudalis rounded; the external soft ray of the ventrals extending as a filiform appendage beyond the other rays, which do not reach the front end of the anal. Greenish olive, with three or four irregular longitudinal bands of dull greenish yellow; a dusky spot at the end of the operculum; fins uniform. (*Baird.*)

New Jersey; New York.

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* 1. Centrarchus viridis, *Cuv. & Val.* vii. p. 460.—Southern parts of N. America.

3. Centrarchus interruptus.

Centrarchus interruptus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 129.
—— maculosus, *Ayres, Proc. Californ. Ac. Nat. Hist.* 1854, p. 8.
Ambloplites interruptus, *Girard, U. S. Pac. R. R. Exp. Fishes,* p. 10. pl. 2. f. 1–4.

D. $\frac{13}{8-11}$. A. $\frac{6-7}{10-9}$.

The length of the head is about one-third of the total; the diameter of the eye one-fourth of the length of the head. Greyish brown, with irregular darker transverse bands, interrupted along the lateral line; the portion of the band above is somewhat alternating with that beneath it; a large black spot above the angle of the operculum; two dark streaks diverge from the eye backwards. (*Gir.*)

Rivers of California.

4. Centrarchus irideus.

Perca iridea, *Bosc.*
Labrus sparoides, *Lacép.* iii. pl. 24. f. 2.
—— iris, *Lacép.* iv. p. 716. pl. 5. f. 3.
—— macropterus, *Lacép.* iii. pl. 24. f. 1.
Centrarchus irideus, *Cuv. & Val.* iii. p. 89; *Holbr. Ichth. S. Carol.* p. 15. pl. 3. f. 1.
—— sparoides, *Cuv. & Val.* vii. p. 458 (not pl. 48).

D. $\frac{11-12}{14-13}$. A. $\frac{8-9}{15}$.

Greenish, with series of black spots; the rays of the vertical fins with alternate black and white spots. Dorsal fin with a dusky spot, bordered with orange near the posterior extremity of the fin (more indistinct in old age).

Charleston.

5. Centrarchus hexacanthus.

Centrarchus sparoides, *Cuv. & Val.* iii. p. 88. pl. 48.
—— hexacanthus, *Cuv. & Val.* vii. p. 458; *Kirtland, Bost. Journ.* iii. p. 480. pl. 29. f. 2.
Cichla storeria, *Kirtl. Rep. Zool. Ohio,* p. 191.
Pomotis hexacanthus, *Holbr. Ichth. S. Carol.* p. 36. pl. 6. f. 1.

D. $\frac{7-8}{16-15}$. A. $\frac{6}{17-18}$. Cæc. pylor. 8.

The form of the head and body is similar to that of *C. æneus.* Præoperculum with some irregular denticulations at the angle and at the lower limb. Body and vertical fins irregularly spotted with blackish.

Fresh waters of North America.

a–e. Adult, half-grown, and young: skins. Streams leading into Lake Erie. From Dr. Parnell's Collection.
f–h. Young.

6. Centrarchus nitidus.

Pomoxis nitidus, *Girard in U.S. Pac. R. R. Exp. Fishes,* p. 6. pl. 2. f. 5–8.

D. $\frac{6}{15}$. A. $\frac{6}{17}$.

The height of the body is one-third of the total length, and more than the length of the head. Præoperculum entire. Back and vertical fins irregularly spotted with blackish, on the back grouped together in bands. (*Gir.*)

Houston River, Kentucky.

7. Centrarchus fasciatus.

Cichla fasciata, *Lesueur, Journ. Ac. Nat. Sc. Philad.* ii. p. 216.
—— ohioensis, minima, *Lesueur, l. c.* p. 218.
Centrarchus fasciatus, *Dekay, New York Fauna, Fishes,* p. 28. pl. 3. f. 8; *Kirtl. Bost. Journ.* v. p. 28. pl. 9. f. 1.

$$D. \frac{10}{14}. \quad A. \frac{3}{12}.$$

Body gibbous; the height is $3\frac{1}{3}$ in the total length. Dusky bluish, often with transverse bands.

Lakes of the United States.

8. Centrarchus obscurus.

Dekay, New York Fauna, Fishes, p. 30. pl. 17. f. 47 (in the text 48).

$$D. \frac{10}{12}. \quad A. \frac{3}{12}.$$

Body rather elongate, not gibbous; the height is one-fourth of the total length. Uniform greenish brown. (*Dekay.*)

Onondaga Creek.

9. Centrarchus gulosus.

Pomotis gulosus, *Cuv. & Val.* iii. p. 498.
Centrarchus gulosus, *Cuv. & Val.* vii. p. 459.

$$D. \frac{10}{9}. \quad A. \frac{3}{8}.$$

Brown, shining golden; a black spot above the angle of the operculum. (*Cuv. & Val.*)

Lake Pont Chartrain; Lakes near New Orleans.

10. Centrarchus tetracanthus.

Cuv. & Val. vii. p. 460.

$$D. \frac{15}{10}. \quad A. \frac{4}{9}.$$

The height of the body is about one-third of the total length. Body and vertical fins spotted with blackish. (*Val.*)

Fresh waters of Cuba.

56. BRYTTUS*.

Bryttus, *Cuv. & Val.* vii. p. 461.

Six (five) branchiostegals. All the teeth villiform, without canines;

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* 1. Bryttus reticulatus, *Cuv. & Val.* vii. p. 463.—North America.
2. Calliurus diaphanus, *Girard, U. S. Pacif. R. R. Exp. Fishes,* p. 13. pl. 4. f. 1–4.—Texas.
3. Bryttus signifer, *Girard, l. c.* pl. 7. f. 5–8.—Texas.
4. —— humilis, *Girard, l. c.* pl. 7. f. 9–24.—Arkansas and Texas.
5. Calliurus microps, *Girard, l. c.* p. 17. pl. 4. f. 5–8.—Texas.

teeth on the palatine bones*. One dorsal, with ten (occasionally with nine) spines, the anal fin with three. Operculum with a rounded, membranaceous, coloured lobe above the angle; præoperculum entire. Scales moderate.

Fresh waters of the Nearctic region.

1. **Bryttus punctatus.**

Bryttus punctatus, *Cuv. & Val.* vii. p. 462.
—— unicolor, *Cuv. & Val.* vii. p. 464.

D. $\frac{10}{11}$. A. $\frac{3}{8-9}$. L. lat. 35.

The height of the body is one-half of the total length (without caudal fin); the length of the head one-third. Caudalis emarginate, with rounded lobes; the first ray of the ventral pointed. Brownish green, with parallel series of round black spots; cheeks black-spotted. Angle and inferior limb of operculum blackish. Ventrals black. (*Val.*)

Fresh waters of North America.

2. **Bryttus albulus.**

Girard, U.S. Pacif. R. R. Exp. Fishes, p. 19. pl. 6. f. 1–4.

B. 5. D. $\frac{10}{11}$. A. $\frac{3}{10}$. L. transv. 6/16.

The height of the body is $2\frac{1}{2}$, the length of the head $3\frac{1}{2}$ in the total length. The upper maxillary reaches to the anterior margin of the orbit. Pale reddish brown, dorsal with a black patch (not marked in the figure). (*Gir.*)

Rio Blanco (Texas).

3. **Bryttus longulus.**

Pomotis longulus, *Baird & Girard, Proc. Acad. Nat. Sc. Philad.* 1853, p. 391, *and in Marcy's Explor. Red River,* p. 245. pl. 12.
Bryttus longulus, *Baird & Girard, l. c.* 1854, p. 25.
Calliurus formosus, *Girard, U. S. Pacif. R. R. Exped. Fishes,* p. 14. pl. 5. f. 1–4.
—— longulus, *Girard, l. c.* p. 16. pl. 5. f. 5–8, pl. 6. f. 5–8.

D. $\frac{10}{11-12}$. A. $\frac{3}{8-9}$. L. lat. 52.

The height of the body is about three times in the total length, the length of the head $3\frac{1}{2}$; the upper maxillary does not extend to the vertical from the posterior margin of the eye. Reddish brown; the dorsal and anal with a subcircular large black spot behind; ventrals and the external half of the anal yellowish. (*B. & G.*)

Red River; fresh waters of Texas and Arkansas.

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* Sir J. Richardson probably made a mistake in translating the diagnosis of Cuvier, if he attributes to this genus "a narrow band of villiform teeth on the tongue." (*Ichthyol.* p. 277.)

4. Bryttus floridensis.

Calliurus floridensis, *Holbr. Journ. Acad. Nat. Sc. Philad.* 1855, p. 53. pl. 6. f. 1.

D. $\frac{10}{10}$. A. $\frac{3}{10}$.

The height of the body is $2\frac{2}{3}$ in the total length, the length of the head $3\frac{1}{2}$. The upper maxillary reaches to the middle of the orbit. Caudalis subtruncated, with rounded angles. Opercular appendage very short. Dusky above, with black spots along the sides; anal and caudal fins dusky; dorsal with a reddish-brown spot at its posterior inferior margin. (*Holbr.*)

St. John's River (Florida).

This species is said to have the tongue armed with a patch of asperities.

5. Bryttus melanops.

Calliurus melanops, *Girard, U. S. Pacif. R. R. Exp. Fishes,* p. 11. pl. 3.

D. $\frac{10}{10}$. A. $\frac{3}{9}$.

The height of the body equals the length of the head, and is about one-third of the total. The upper maxillary reaches to the vertical from the posterior margin of the orbit. Reddish, with a blackish spot at the centre of each scale. (*Gir.*)

Fresh waters of Texas.

6. Bryttus murinus.

Calliurus murinus, *Girard, U. S. Pacif. R. R. Exped. Fishes,* p. 18. pl. 7. f. 1–4.

D. $\frac{10}{12}$. A. $\frac{3}{10}$.

The height of the body equals nearly the length of the head, and is one-third of the total. The upper maxillary does not reach to the vertical from the centre of the eye. Dark blackish brown; the dorsal with a black patch behind. (*Gir.*)

Fresh waters of Texas.

7. Bryttus fasciatus.

Holbr. Journ. Acad. Nat. Sc. Philad. 1855, p. 51. pl. 5. f. 3.

D. $\frac{9}{12}$. A. $\frac{3}{11}$.

The height of the body is $2\frac{1}{2}$ in the total length; the length of the head $3\frac{1}{2}$. Caudalis rounded. Olive-brown, with dusky vertical bars; below yellowish, with numerous crimson spots. (*Holbr.*)

St. John's River (Florida).

8. Bryttus gloriosus.

Holbrook, l. c. p. 52. pl. 5. f. 4.

D. $\frac{9}{11}$. A. $\frac{3}{10}$.

The height of the body is $2\frac{2}{5}$ in the total length, the length of the

head 3½. Caudalis rounded. Olive-brown: head, body, dorsal and anal fins with numerous golden spots; a black blotch at the root of the caudal fin. (*Holbr.*)

Cooper River; South Carolina; Georgia.

57. POMOTIS*.

Pomotis, *Cuv. Règne Anim.*; *Cuv. & Val.* iii. p. 90.

Six branchiostegals. All the teeth villiform, without canines; teeth neither on the palatines nor on the tongue. One dorsal, with ten, rarely with nine or eleven spines; the anal fin with three spines. Operculum with a rounded, membranaceous, coloured lobe above the angle; præoperculum entire or minutely crenulated. Scales moderate. Air-bladder large, subdivided posteriorly into two horns. Pyloric appendages in small number (6–8).

Fresh waters of the Nearctic region.

1. Pomotis auritus.

Labrus auritus, *L. Gm.* p. 1286; *Bl. Schn.* p. 246; *Shaw, Zool.* iv. p. 482.

Perca gibbosa, *Catesby*, t. 8. f. 3.

Pomotis vulgaris, *Cuv. & Val.* iii. p. 91. pl. 49, vii. p. 465; *Richards. Faun. Bor. Amer.* p. 24. pl. 76; *Kirtland in Bost. Journ.* iii. p. 470. pl. 28. f. 2; *Cuv. Règne Anim. Ill. Poiss.* pl. 10. f. 3; *Dekay, New York Fauna, Fish.* p. 31. pl. 51. f. 166; *Holbr. Ichth. S. Carol.* p. 6. pl. 1. f. 2.

D. $\frac{10}{11-12}$. A. $\frac{3}{10}$. L. lat. 33–34. L. transv. $\frac{5}{12-14}$. Vert. 14/16. Cæc. pylor. 6–8.

The height of the body is 2½ in the total length, the length of the head 3½; the diameter of the eye is one-fourth of the latter, or two-thirds of the distance between the eyes. Præoperculum slightly serrated; caudal fin slightly notched, with rounded lobes. The length of the third dorsal spine 2½ or three times in the length of the head. Coloration uniform, with a black lobe at the operculum, and with series of brownish spots between the rays of the vertical fins.

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* 1. Pomotis tetracanthus, *Cuv. & Val.* iii. p. 94.—Buenos Ayres.
2. —— ravenelii, *Cuv. & Val.* vii. p. 465.—N. America.
3. —— holbrookii, *Cuv. & Val.* vii. p. 466.—Charleston.
4. —— incisor, *Cuv. & Val.* vii. p. 466; *Holbr. Ichth. S. Carol.* p. 13. pl. 2. f. 1.—New Orleans, S. Carolina.
5. —— gibbosus, *Cuv. & Val.* vii. p. 467.—Charleston.
6. —— solis, *Cuv. & Val.* vii. p. 468.—Lake Pont Chartrain.
7. —— catesbyi, *Cuv. & Val.* vii. p. 469.—Philadelphia.
8. —— breviceps, *Baird & Girard, Proc. Ac. Nat. Sci. Philad.* 1853, p. 390, and in *Marcy's Explor. Red River, Zool.* p. 246. pl. 13, and in *U. S. Pacif. R. R. Exp. Fish.* p. 28.—Red River.
9. Labrus appendix, *Mitch. Suppl. Mem. Amer. Monthly Mag.* ii. p. 247.—Pomotis appendix, *Dekay, New York Fauna*, p. 32.—N. America.
10. Pomotis nitidus, *Kirtl. Bost. Journ.* iii. p. 472. pl. 28. f. 1.—Ohio.
11. —— luna, *Gir. U. S. Pacif. R. R. Exped. Fish.* p. 22. pl. 8. f. 1–4.—U. S.
12. —— aquilensis, *Baird & Girard, Proc. Ac. Nat. Sci. Philad.* 1853. p. 387, and *U. S. Pacif. R. R. Exped. Fish.* p. 25. pl. 9. f. 1–4, pl. 10. f. 8–11.—P. nefastus, *Baird & Girard, Proc. Ac. Nat. Sci. Philad.* 1854, p. 24.—P. popeii, *Girard, U. S. Pacif. R. R. Exp. Fish.* p. 26.

North America.

a. Adult: skin. Lake Erie. From Dr. Parnell's Collection.
b. Adult. New York. From Mr. Brandt's Collection.
c, *d*. Adult. N. America. From Mr. Warwick's Collection.
e. Adult: skin. New Orleans. From Dr. Parnell's Collection.
f. Young. New Orleans.
g, *h*. Young.

Var. Uniform blackish brown.

i. Adult: skin. Lake Erie. From Dr. Parnell's Collection.

2. **Pomotis rubricauda.**

Pomotis rubricauda, *Storer, Bost. Journ. Nat. Hist.* iv. p. 177; *Holbr. Ichth. S. Carol.* p. 10. pl. 2. f. 2.
—— appendix, *Storer, Synops.* p. 42.
—— fallax, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 24, and *U.S. Pacif. R. R. Exp. Fishes*, p. 27. pl. 8. f. 9–12, pl. 9. f. 5–12, pl. 10. f. 1–7.
—— convexifrons, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 24.

D. $\frac{10}{11}$. A. $\frac{3}{10}$. Cæc. pylor. 7.

The height of the body is about $2\frac{2}{3}$ in the total length, the length of the head (without appendage) four times. The appendage very long, one-half of the length of the head (in mature specimens). Præoperculum rounded, not, or but slightly, serrated at its angle. The spinous portion of the dorsal lower than the soft. The pectoral not reaching so far backwards as the ventral. Caudal fin slightly notched, with rounded lobes. Above dusky, sides of the opercles and below red, some blue waving lines on the sides of the head. Appendage black, bordered above and below with pale greenish blue. Fins uniform yellowish; dorsal fin sometimes with a darker patch.

Fresh waters from Massachusetts to Georgia and Texas.

a. Half-grown: skin. From Dr. Parnell's Collection.

3. **Pomotis elongatus.**

Holbrook in Journ. Acad. Nat. Sc. Philad. 1855, p. 47. pl. 5. f. 1.

D. $\frac{10}{12}$. A. $\frac{3}{10}$.

The height of the body is $2\frac{2}{3}$ in the total length, the length of the head four times. The upper maxillary reaches to the anterior margin of the eye. Opercular lobe black, of moderate size. Caudalis emarginate, with rounded lobes. The soft portion of the dorsal higher than the spinous. Cheeks with pale bluish lines; body dusky above, yellow below, with several dark vertical bars on the sides, and a black blotch on the back of the tail behind the dorsal fin. (*Holbr.*)

St. John's River; Florida.

4. Pomotis speciosus.

Baird & Girard, Proc. Ac. Nat. Sc. Philad. 1854, p. 24, and *U. S. Pacif. R. R. Exp. Fishes,* p. 23. pl. 8. f. 5–8 (not *Holbrook*).

D. $\frac{10}{11}$. A. $\frac{3}{11}$. L. lat. 43.

The length of the head is one-fourth of the total; the diameter of the eye one-fourth of the length of the head. Caudalis emarginate; pectorals reaching as far backwards as the ventrals. Brownish, with a narrow blackish band parallel to, and near, the dorsal line; posterior part of the soft dorsal with a large subcircular blackish spot; anal and ventrals blackish; pectorals yellowish.

Fresh waters of the United States. (Texas.)

Some of the specimens in the British Museum Collection have the spinous dorsal rather elevated, the fifth spine being more than one-half of the length of the head. Others have the same spine much shorter, contained about 2½ in the length of the head. These specimens, perhaps, are specifically different, but exhibit the black dorsal spot mentioned in the diagnosis.

a–e. Adult, half-grown, and young: skins. (Lake Erie?) From Dr. Parnell's Collection.

5. Pomotis chætodon.

Baird in the Ninth Smithson. Report, p. 324.

D. $\frac{10}{11}$. A. $\frac{3}{12}$.

The height of the body is more than one-half of the total length; eye large, only one-third of the length of the head. Caudalis subtruncated; the pectorals and ventrals extending beyond the third anal spine. Dirty white, with six black vertical bands; ventrals black in the centre; the dorsal black between the three anterior rays. (*Baird.*)

Cedar Swamp Creek, New Jersey.

6. Pomotis heros.

Baird & Girard, Proc. Ac. Nat. Sc. Philad. 1854, p. 25, and *U. S. Pacif. R. R. Exp. Fishes,* p. 24. pl. 9. f. 13–16.

D. $\frac{10}{12}$. A. $\frac{3}{11}$.

The length of the head is 3½ in the total; the diameter of the eye one-fourth of the former. Pectorals very long, extending to the second soft ray of the anal fin. Caudalis emarginate; the spinous dorsal elevated. Uniform blackish brown; pectorals yellowish; other fins greyish. (*B. & G.*)

Texas.

Compare *Pomotis machrochir*[*a,* Raf.], Kirtland, *Bost. Journ.* iii p. 469. pl. 27. f. 3.

7. Pomotis microlophus.

Pomotis speciosus, *Holbr. Journ. Ac. Nat. Sc. Philad.* 1855, p. 48. pl. 5. f. 2 (not *Baird & Girard*).

D. $\frac{10}{10}$. A. $\frac{3}{9}$.

The height of the body is $2\frac{2}{3}$ in the total length, the length of the head four times; the diameter of the eye is one-fourth of the latter. The upper maxillary reaches nearly to the anterior margin of the eye. Opercular lobe small, black, edged with red. Caudalis emarginate, with rounded lobes; the soft dorsal higher than the spinous; the tenth dorsal spine much longer than the ninth (according to the figure quoted); the pectoral fin extends to the second anal ray, the ventral to the first spine. Brownish olive, with a few reddish-brown spots on the sides; lateral line red: fins immaculate. (*Holbr.*)

St. John's River (Florida).

8. Pomotis marginatus.

Holbr. l. c. p. 49. pl. 6. f. 2.

D. $\frac{9}{12}$. A. $\frac{3}{10}$.

The height of the body is $2\frac{2}{5}$ in the total length, the length of the head $3\frac{3}{4}$; snout shorter than the diameter of the eye; the upper maxillary extending to the orbit. Caudalis slightly emarginate; the pectoral reaches to the vent, the ventral to the origin of the anal. Dusky olive brown, with vertical bars of the same colour; head and body with numerous bluish-green spots; opercular appendix bordered with green. (*Holbr.*)

St. John's River (Florida).

58. ANOPLUS.

Anoplus, *Temm. & Schleg. Faun. Japon. Poiss.* p. 17.

Branchiostegals six. The outer teeth of the jaws short, but rather thick; teeth on the vomer; none on the palatine bones. Dorsal deeply notched, the first portion with ten, the anal with three spines; all the spines very long, strong, and flattened. Caudalis very slightly notched. Præoperculum very finely serrated; the other opercles neither serrated nor armed.

Japanese Sea.

1. Anoplus banjos.

Banjos, *Krusenstern's Reise*, pl. 54. f. 1.
Anoplus, sp., *Faun. Japon. l. c.* pl. 8.
Anoplus banjos, *Richards. Ichth. China*, p. 236.

D. $\frac{10}{12}$. A. $\frac{3}{7}$. L. lat. 66.

The third dorsal spine two-thirds of the height of the body; the soft dorsal with a deep-black spot at the upper extremity.

a, b. Adult: stuffed. Japan. From the Leyden Museum.

59. ODONTONECTES.

Cæsio, sp., *Cuv. & Val.* vi. p. 442.

Six branchiostegals. Villiform teeth in the jaws, on the vomer and the palatine bones; an outer series of larger teeth in the jaws; canines very small. One dorsal, with ten spines, and with the basal half scaly; the anal fin with three spines. Opercular points indistinct; the angle of the præoperculum very slightly serrated. Scales moderate, without visible serrature. Cleft of the mouth oblique, the lower jaw longest; eye moderate. Pyloric appendages in small number; air-bladder with two narrow processes in front to the base of the skull.

East Indian Seas.

This fish cannot be referred to *Cæsio*, having distinct bands of palatine and vomerine teeth; nor to Cuvier's family of *Mænidæ*, not having the mouth more protractile than the greater part of the *Percidæ*. It is very probable that *Cæsio lunaris*, and some other similar species which I have had no opportunity of examining, should also be referred to this genus.

1. Odontonectes erythrogaster.

Renard, i. 32. 174.

Cæsio erythrogaster, (*Kuhl & van Hass.*) *Cuv. & Val.* vi. p. 442. pl. 166; *Bleek. Verh. Batav. Genootsch.* xxiii. *Mænid.* p. 9.

B. 6. D. $\frac{10}{15}$. A. $\frac{3}{11}$. L. lat. 53. L. transv. 7/13. Vert. 10/14. Cæc. pylor. 5.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head four times; the snout is equal to the diameter of the eye, and about one-fourth of the length of the head. The upper maxillary reaches scarcely beyond the vertical from the anterior margin of the eye; the angle of the præoperculum rounded and very finely serrated. The basal half of the dorsal and anal fins scaly; all the spines slender and flexible; the fourth of the dorsal longest; dorsal continuous; caudalis deeply forked; the second and third anal spines nearly equal. Above bluish green; belly rose-coloured.

East Indian Seas.

a. Adult. Amboyna. Purchased of Mr. Frank.
b. Adult: skeleton. Amboyna. Purchased of Mr. Frank.
c. Adult: not good state. Molucca Sea. Purchased of Mr. Frank.
d. Adult. From the Haslar Collection.
e. Adult. From the Haslar Collection.
f. Adult.
g. Adult. From Mr. Brandt's Collection.

Skeleton.—The skull of this species is distinguished by the exceedingly high crest, which extends from the *foramen occipitale* to the anterior end of the frontal bones; it is triangular, and supported by a bony ridge arising from the supraoccipital bone and ascending in an oblique direction. There are, besides, the two usual lateral ridges, moderately developed. The basal portion of the skull is not globose or swollen. The jaw-bones are rather feeble; the maxillary is styliform in its basal half, and widens at the opposite extremity, so that the posterior and anterior margins are equally and slightly concave. The articulary processes of the intermaxillary bones are shorter than the bones themselves, and are received in a slight groove of the extremity of the occipital crest. The muciferous channel of the lower jaw is little developed, like those of the other parts of the skull. The præorbital is falciform, and has no denticulation whatever; the suborbital arch is narrow, with an interior ridge reaching into the orbit. The præoperculum is indistinctly serrated at the angle only; the posterior edge is nearly vertical, the inferior and the angle slightly rounded. The operculum has a slight ridge at the inner side, terminating in an obtuse point; the sub- and interoperculum are narrow and slightly curved. The coracoid, the ulna, and the radius are remarkably broad, the pubic bones rather narrow and very elongate.

The teeth are very small, and arranged in a single series in the upper and lower jaws. The band of vomerine teeth is bent at an obtuse angle, and narrow, like that of the palatine bones.

There are ten abdominal and fourteen caudal vertebræ, the length of the former portion of the vertebral column being to that of the caudal as 1 : 1·6. The neural and hæmal spines are slender; the first interhæmal is attached to the hæmals of the eleventh and twelfth vertebræ by a slender and styliform portion, and forms a broad semicircular plate, to which the anal spines are joined.

60. DULES[*].

Dules, *Cuv. & Val.* iii. p. 111.

Six branchiostegals. All the teeth villiform, without canines; teeth on the palatine bones. One dorsal, with ten spines, the anal fin with three. Operculum with two or three points, præoperculum serrated. Scales moderate, minutely serrated; chin not very prominent; eyes moderate.

Seas between the Tropics, some species entering into the rivers.

1. Dules auriga.

Cuv. & Val. iii. p. 112. pl. 51; *Dekay, New York Fauna, Fishes*, p. 34. pl. 19. f. 54; *Jenyns, Zool. of the Beagle, Fishes*, p. 16.

D. $\frac{10}{13}$. A. $\frac{3}{7}$. Vert. 10/14.

The third dorsal spine very elongate, filiform, half the length of the total. Caudalis truncated. Operculum with three spines. Yellowish grey, with two or three darker cross-bands.

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[*] 1. Dules vanicolensis, *Cuv. & Val.* vii. p. 478; *Dumont d'Urville, Voy. Pôle Sud, Poiss.* p. 42. pl. 3. f. 2 (the figures of species of *Dules*, quoted from this work, do not appear to be very correctly executed with regard to their coloration)

This fish much resembles the genus *Centropristis*.

Coast of Brazil (and of North America?).

a. Adult. Bahia. Purchased of M. Parzudaki.

2. **Dules flaviventris.**

Cuv. & Val. iii. p. 113.

D. $\frac{10}{12}$. A. $\frac{3}{7}$.

No elongate dorsal spine. Caudalis truncated. Operculum with three spines. Brownish, with a large yellow space on the belly, and with two round black spots on each side, at the base of the caudal fin. (*Cuv.*)

Coast of Brazil.

I suppose that this species belongs to *Centropristis*.

3. **Dules caudavittatus.**

Holocentrus caudavittatus, *Lacép.* iv. pp. 332, 367.
Dules caudavittatus, *Cuv. & Val.* iii. p. 117, vii. p. 475; *Règne Anim. Ill. Poiss.* pl. 11. f. 2.

D. $\frac{10}{14}$. A. $\frac{3}{13}$. L. lat. 50. L. transv. 19.

In habit very similar to *D. tæniurus*. Caudal fin with two black cross-bands, the posterior of which forms a black edge; the soft dorsal fin without black. (*Cuv. & Val.*)

Isle de France.

4. **Dules tæniurus.**

Cuv. & Val. iii. p. 114; *Bleeker, Perc.* p. 49.

D. $\frac{10}{10}$. A. $\frac{3}{11}$. L. lat. 50–55. L. transv. 6/12.

The height of the body is $3\frac{2}{3}$ in the total length, the length of the head $4\frac{1}{4}$; the diameter of the eye is one-third of the latter. Operculum with two spines. Caudalis deeply notched; the fourth and fifth dorsal spines longest, the tenth shorter than the following ray; the spinous and the soft portion of the dorsal nearly equal in height and in length; the second anal spine stronger, but shorter than the third. Above steel-blue; each lobe of the caudal brown, with an oblique white band; both bands convergent posteriorly; the soft dorsal anteriorly and above with a brownish margin.

Chinese and Javanese Seas.

Bleeker (*l. c.*) mentions only forty scales in a longitudinal line, as is the case in *D. marginatus*.

a. Fine specimen. Chinese Sea. Presented by Capt. Sir E. Belcher.
b. Adult. Chinese Sea. Presented by Capt. Sir E. Belcher.
c. Adult. Chinese Sea. Presented by Capt. Sir E. Belcher.

5. **Dules fuscus.**

Cuv. & Val. iii. p. 118; *Peters, Wiegm. Arch.* 1855, p. 238.

D. $\frac{10}{11}$. A. $\frac{3}{10}$.

In habit similar to *D. tæniurus.* Brown; the dorsal fin uniform brown; caudalis with some indistinct blackish longitudinal lines; analis with a series of black spots along the base. (*Cuv.*)

Isle de France; Island of Anjoana (Mozambique).

6. **Dules marginatus.**

Cuv. & Val. iii. p. 116. pl. 52, vii. p. 474; *Dumont d'Urville, Voy. Pôle Sud, Poiss.* p. 41. pl. 3. f. 3; *Bleeker, Sumatra,* i. p. 573.

D. $\frac{10}{11}$. A. $\frac{3}{11\text{–}12}$. L. lat. 40–45. L. transv. 5/8. Cæc. pylor. 8.

In habit similar to *D. tæniurus.* The fourth and fifth dorsal spines longest, the tenth as long as the following ray; the second anal spine stronger, but shorter than the third. Greyish above; caudal fin with two black cross-bands, the posterior of which forms a black edge; the soft dorsal fin anteriorly and above with a black band.

Sea of Java. Amboyna. Vanicolo. Feejee Islands.

a. Adult. Java.
b. Adult. Amboyna. From Mr. Frank's Collection.
c. Adult. Amboyna. From the Collection of Madame I. Pfeiffer.
d. Adult. Amboyna. Purchased of Mr. Stevens.
e–g. Adult and half-grown. Feejee Islands. Presented by the Lords of the Admiralty.
h. Adult. Feejee Islands. From Mr. Macgillivray's Collection.
i, *k*. Adult: stuffed.

7. **Dules rupestris.**

Centropomus rupestris, *Lacép.* iv. pp. 252, 273.
Dules rupestris, *Cuv. & Val.* iii. p. 119, vii. p. 477; ? *Bleek. Natuurk. Tydschr. Ned. Indie,* vi. p. 209.
—— maculatus, *Cuv. & Val.* vii. p. 475; *Bleek. Amboina,* iv. p. 333.

D. $\frac{10}{10\text{–}11}$. A. $\frac{3}{10\text{–}11}$. L. lat. 40–42. L. transv. 4/8. Vert. 11/15. Cæc. pylor. 7.

The height of the body is $3\frac{1}{2}$–$3\frac{2}{3}$ in the total length, and the length of the head $4\frac{1}{3}$–$4\frac{2}{5}$; the diameter of the eyes equal to, or less than, the distance between them. Operculum with two spines. Caudalis truncated, or slightly emarginate; the fourth and fifth dorsal spines longest, the spinous portion of the dorsal sometimes higher, sometimes rather lower than the soft. Brownish grey above, each scale with a deep-black spot in the centre; the vertical fins brown-spotted, and edged with blackish.

Fresh waters of Isle de France, of Celebes and Amboyna, of the Feejee Islands, and of the Island of Ooalau.

a. Large specimen. Feejee Islands. Voyage of the Herald.

b. Large specimen: skeleton. Feejee Islands. Voyage of the Herald.
c–e. Adult and half-grown. Island of Ooalau (fresh waters). Voyage of the Herald.
f. Adult. Island of Ooalau (fresh waters). Voyage of the Herald.
g–i. Adult. Amboyna. Purchased of Mr. Frank.
k. Adult. Isle de France. Presented by the Zoological Society.
l. Adult. From the Collection of the Zoological Society.

Skeleton.—This genus, or at least this species of the genus, is justly considered to be a true Percoid, the bones of the skull offering all the characters of the family, although somewhat modified in form. The upper part of the skull is broad, flat, slightly rounded on the sides, rough, but without any prominent ridges. The occipital crest is well developed, pointed behind, but does not extend on to the upper surface of the skull; the nasals are narrow, cylindrical, tubiform. The præorbital is small, only one-third as broad as the distance between the eyes, and minutely serrated on the posterior third of the lower margin; the suborbital arch is feeble, rather narrow, and there is no interior plate for supporting the eyeball. The upper maxillary is rather slender, widening behind, and with a slightly convex upper edge and a concave one beneath. The operculum has two very acute spines, the terminations of two ridges at its interior surface. The lower spine is much longer, and obliquely directed downwards. The præoperculum is entire behind, nearly right-angular, and has a minutely serrated inferior margin. The suboperculum is distinguished by a deep notch in the lower limb, in front of which it shows an exceedingly fine serrature. The interoperculum has a rounded inferior margin, with some denticulations so fine as to be hardly visible. The suprascapula and humerus are finely serrated; the lower coracoid narrow, styliform.

The length of the abdominal vertebral column is to that of the caudal as 11 : 15; the first interhæmal spine is not very strong, equal to the length of the third to the eighth vertebra, and attached to the twelfth hæmal spine.

The dentition is very complete: there are villiform bands in both the jaws, reaching to the extremities of the bones; on the vomer in a broad band, forming a right angle; on the palatine and pterygoid bones in narrow separate bands; and, finally, in an oval patch on the entopterygoid. The teeth on the pharyngo-branchial or upper pharyngeal bone are remarkably strong and rasp-like.

8. **Dules guamensis.**

Cuv. & Val. vii. p. 474; *Dumont d'Urville, Voy. Pôle Sud, Poiss.* p. 42. pl. 3. f. 1.

$$D. \frac{10}{10}. \quad A. \frac{3}{10}.$$

In habit similar to *D. tæniurus*. Fins immaculate, each lobe of the caudal black at the tip. (*Val.*)

Sea of Guam.

9. Dules malo.

Dules malo, *Cuv. & Val.* vii. p. 479; *Dumont d'Urville, l. c.* p. 43. pl. 3. f. 4.
—— mato, *Less. Voy. Coq. Zool.* ii. p. 223.
—— leuciscus, *Jenyns, Zool. of the Beagle, Fishes,* p. 17.

D. $\frac{10}{11}$. A. $\frac{3}{11-12}$.

The height of the body is one-third of the total length (without caudal fin); the diameter of the eye is larger than one-third of the length of the head, or than the distance between the eyes. Silvery white, brownish on the back; the dorsal, anal, and ventral fins brown-spotted.

River Matavai (Otaiti).

10. Dules bennetti.

Perca argentea, *Bennett, Fishes of Ceylon,* pl. 22.
Dules bennetti, (*Bleeker*) *Peters, Wiegm. Arch.* 1855, p. 238.

B. 5? (*Bennett*). D. $\frac{10}{9}$. A. $\frac{3}{10}$. L. lat. 50. L. transv. 6/12.

Caudalis forked. Uniform silvery; a black streak along the middle of the caudal, and on each lobe two oblique black transverse bands, confluent into an oval; all the other fins immaculate. (*Benn.*)

Sea of Ceylon (*Bennett*). Fresh waters of Mozambique (*Peters*).

a. Adult. Presented by Sir A. Smith.—The soft dorsal fin with a black tip. Perhaps a variety of *D. tæniurus*.

11. Dules ambiguus.

Datnia ambigua, *Richardson, Voy. Ereb. & Terr. Fishes,* p. 25. pl. 19.

D. $\frac{10}{11}$. A. $\frac{3}{9}$. L. lat. 85.

The spines of the fins very strong; the snout rather elongate, much longer than the eye; præoperculum with spinous teeth at the inferior limb, directed forwards. Coloration uniform.

Western Australia.

a. Adult: bad state; has been in chloride of zinc. From the Haslar Collection.

b, c. Adult: stuffed. West Australia. Presented by Captain Sir G. Grey.

Before we proceed to the family of the *Pristipomatidæ*, which contain fishes with the habit and many of the characters of the *Percidæ*, and which enter into a nearly continuous series with our last genera (*Odontonectes, Dules*), we are obliged to intercalate a fish, which we dare not remove very far from *Pomotis, Centrarchus*, and *Bryttus*—fishes with a similar structure of the vertical fins, and inhabitants of the fresh waters of the same geographical region. The extraordinary position of the vent, before the ventrals (as occurs again in *Amblyopsis*), and the number of the rays of the ventrals demand the formation of a separate family for this fish.

Fam. 4. APHREDODERIDÆ.

Form of the body oblong; eyes lateral; cleft of the mouth extending on to the sides of the muzzle; vent jugular, before the ventrals. Villiform teeth in both the jaws and on the palate. Six branchiostegals. Some of the bones of the skull armed. Scales ctenoid. Ventral fins thoracic, with more than five soft rays. One single dorsal, with the spinous portion little developed. Cæca pylorica in moderate number. Air-bladder simple.

Fresh waters of North America.

One genus.

1. APHREDODERUS.

Aphredoderus, (*Lesueur*) *Cuv. & Val.* ix. p. 445; *Dekay, New York Fauna, Fishes*, p. 35.

Cleft of the mouth slightly oblique, with the lower jaw longest; eye moderate. Villiform teeth in both the jaws, on the vomer and on the palatine bones. Six branchiostegals. Infraorbital and præoperculum with spinous teeth. Scales moderate, ctenoid. Dorsal with three, anal with two spines. Caudalis rounded. Pseudobranchiæ?

Fresh waters of North America.

1. Aphredoderus sayanus.

Scolopsis sayanus, *Gilliams, Journ. Ac. Nat. Sc. Philad.* iv. p. 81. pl. 3.
Aphredoderus gibbosus, (*Lesueur*) *Cuv. & Val.* ix. p. 448. pl. 278.
—— sayanus, *Dekay, New York Fauna, Fishes*, p. 35. pl. 21. f. 62; *Baird, Ninth Smithsonian Report*, p. 326.

D. $\frac{3}{11}$. A. $\frac{2}{7}$. L. lat. 45–50. Cæc. pylor. 12.

The height of the body is $4\frac{1}{3}$ in the total length, of which the head is one-fourth; the diameter of the eye is less than the distance from the end of the snout, and two-thirds of the distance between the eyes. The maxillary bone extends beyond the vertical from the anterior margin of the eye; the distance of the anus from the snout is equal to one-fifth of the total length; caudalis rounded. Greenish olive; a vertical spot beneath the eye.

Harrowgate, near Philadelphia; Lake Pont Chartrain. Many streams on the Atlantic coast.

a. Adult: skin. United States. From Dr. Parnell's Collection.

Fam. 5. PRISTIPOMATIDÆ.

Percoidei pt., Sciænoidei pt., Sparoidei pt., et Mænides, *Cuv. Règne Anim.*; *Müller, Berl. Abhandl.* 1844, p. 201.
Percidæ pt., et Sciænidæ pt., *Owen, Lect. Comp. Anat. Vert.* i. p. 49.
Theraponidæ pt., Sciænidæ pt., Sparidæ pt., et Mænides, *Richards.*

Body compressed and oblong, covered with scales, the serrature of which is sometimes exceedingly fine and sometimes wanting. Lateral line continuous, not continued on the caudal fin*. Mouth in front of the snout, with lateral cleft. Eye lateral, of moderate size. Five, six, or seven branchiostegals†. Teeth in villiform bands, with pointed and conical canines in some of the genera; no molars or trenchant teeth in the jaws, generally no teeth on the palate; jaws toothless in two of the genera. No barbels. Cheek not cuirased. One dorsal fin, formed by a spinous and soft portion of nearly equal development, the former of which either contains strong spines or is continuous with the latter; anal similarly developed as the soft dorsal; the lower rays of the pectorals branched; ventrals thoracic, with one spine and five soft rays. The bones of the head with a rudimentary or moderately developed muciferous system. Stomach cæcal; pyloric appendages in small or moderate number‡. Air-bladder present, more or less simple. Pseudobranchiæ well developed§.

Carnivorous fishes, without molar or trenchant teeth, inhabiting the seas of the temperate and tropical regions; a few entering fresh waters.

The fishes united by the above characters into a family form a very natural group, in their external structure as well as in their internal organization. A few of the members continue to have vomerine teeth, like *Percidæ*; but they are either deciduous or absent in species closest allied to them. At the end of the family there are some fishes with a more cylindrical habit, and *Erythrichthys* has some resemblance to the *Scombridæ*. There is a South American freshwater fish, *Polycentrus*, and *Hyperoglyphe* from Australia, which disturb the harmony of the characters of this family; but not knowing a better place for them, I thought it best to leave them where they were placed by their first discoverers.

Synopsis of the Genera.

I. *Anal fin with three spines.*

A. *Air-bladder separated by a contraction into an anterior and posterior portion.*

All the teeth villiform and conical .... 1. THERAPON.
Teeth of the outer row with a small lobe on each side .... 2. HELOTES.

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* In *Polycentrus* absent.
† In *Chætopterus* four.
‡ Except in *Hyperoglyphe.*
§ In *Polycentrus* hidden.

B. *Air-bladder not contracted.*

1. *Teeth in the jaws.*

a. Mouth moderately protractile.

* *Præoperculum serrated.*

Seven branchiostegals. A central groove behind the symphysis of the lower jaw. The vertical fins not scaly, or at the base only. Teeth of the jaws villiform …………	4. Pristipoma
Seven (?) branchiostegals. A central groove behind the symphysis of the lower jaw. In each jaw an external series of very stout and conical teeth …………	5. Conodon.
Seven branchiostegals. A central groove behind the symphysis of the lower jaw. The soft portions of the vertical fins scaly to their margin …………	6. Hæmulon.
Seven branchiostegals. Chin covered with barbel-like papillæ.	7. Hapalogenys.
Six or seven branchiostegals. Lower jaw with pores, but without central groove. The upper profile of the head parabolic …………	8. Diagramma.
Seven branchiostegals. The spinous dorsal very low, scarcely continuous with the soft, with eight spines …………	9. Hyperoglyphe.
Six branchiostegals. Body elevated; the upper profile of the head concave …………	10. Lobotes.
Five branchiostegals. Præorbital with a spine directed backwards …………	13. Scolopsis.
Five or six branchiostegals. Præorbital not armed. Caudalis deeply forked …………	14. Heterognathodon.
Seven branchiostegals. Lower jaw without pores. Dorsal fin with ten spines …………	17. Pristipomoides.

* *Præoperculum entire.*

Canine teeth; distance between the eye and the angle of the mouth great; more than three series of scales between the eye and the angle of the præoperculum. Dorsal scaleless …………	15. Dentex.
Canine teeth; distance between the eye and the angle of the mouth great. Three series of scales between the eye and the angle of the præoperculum. Dorsal scaleless …………	16. Synagris
Canine teeth; distance between the eye and the angle of the mouth small. More than three series of scales between the eye and the angle of the præoperculum. Dorsal scaleless …………	18. Pentapus.
Four branchiostegals. Canine teeth none …………	19. Chætopterus.
Seven branchiostegals. Canine teeth none …………	20. Aphareus.
Dorsal scaly along the base …………	23. Cæsio.

b. Mouth very protractile.

Spines of the fins very stout; twelve in the dorsal fin …………	11. Datnioides.
Dorsal $\frac{9}{10}$; anal $\frac{3}{7\,(-9)}$ …………	12. Gerres.
Spines of the fins feeble. Dorsal scaleless. Vomerine teeth…	21. Mæna.
Spines of the fins very feeble. Dorsal scaleless. Vomerine teeth none …………	22. Smaris.

2. *Jaws toothless.*

Spines of the fins very strong	3. MACQUARIA.
Spines of the fins feeble	24. ERYTHRICHTHYS.

II. *Anal fin with more than three spines.*

Anal fin with five spines	25. PENTAPRION.
Anal fin with thirteen spines. No lateral line	26. POLYCENTRUS.

1. THERAPON*.

Therapon, *Cuv. Règne Anim.*; *Cuv. & Val.* iii. p. 125.
Datnia, *Cuv. & Val.* iii. p. 138.
Pelates, *Cuv. Règne Anim.*; *Cuv. & Val.* iii. p. 145.

Six branchiostegals. Eye of moderate size. Teeth villiform in both the jaws, deciduous on the vomer and the palatine bones. Operculum spiniferous; præoperculum serrated. Dorsal more or less notched, with twelve spines (in *Th. caudovittatus* with thirteen); anal with three. Scales moderate. Air-bladder with two divisions, an anterior and posterior, separated from each other by a contraction. Cæca pylorica in moderate number.

From the Red Sea to the Cape of Good Hope through the Indian Ocean to the coasts of Australia. Several species entering rivers.

1. Therapon theraps.

Therapon theraps, *Cuv. & Val.* iii. p. 129. pl. 53; *Bleeker, Perc.* p. 50; *Richards. Ann. & Mag. Nat. Hist.* 1842, vol. ix. p. 126; *Rüpp. Neue Wirb. Fische*, p. 95.

D. $\frac{12}{10}$. A. $\frac{3}{8}$. L. lat. 55. Vert. 10/15.

The height of the body is $3\frac{1}{3}$ in the total length; the length of the head four times. The snout is $1\frac{1}{3}$ the interspace between the eyes. Præoperculum rounded, serrated, with moderate spinous teeth at the angle; operculum with two spines, the lower of which is elongate and strong. Greenish grey, with three straight brown longitudinal bands, the inferior of which extends from the head to the tail; the spinous portion of the dorsal fin blackish between the third and seventh spines; two or three blackish bands obliquely crossing each lobe of the caudal.

All the Indian Seas; Chinese Sea; False Bay: entering rivers.

a. Adult. India.
b. Half-grown. India.
c. Many half-grown and young specimens. East Indies.

* 1. Therapon rubricatus, *Richards. Ann. & Mag. N. H.* 1842, vol. ix. p. 127.—N. W. coast of Australia.
2. —— microlepis, *Rüppell, Verz. Fische des Senckenberg. Mus.* p. 4.—Indian Ocean.
3. —— bouzetianus, *Hombr. & Jacquin. Voy. Pôle Sud, Zool.* iii., *Poiss.* p. 43. pl. 4. f. 2.—*Hab.* ——?

d–f. Young. India. From the Haslar Collection.
g. Half-grown. Singapore.
h, i. Young. Malacca.
k. Half-grown. China.
l. Half-grown. China Seas. Presented by Capt. Sir E. Belcher.
m. Half-grown. China Seas. Presented by Capt. Sir E. Belcher.
n. Adult: stuffed. China Seas. Presented by J. R. Reeves, Esq.
o. Half-grown. China Seas.
p. Adult: skin. False Bay. Voyage of H.M.S. Fly.
q–u. Young. From the Haslar Collection.

? Var.

v. Half-grown. Philippines.

2. Therapon obscurus.

Cuv. & Val. iii. p. 135; *Cantor, Catal.* p. 20.

D. $\frac{12}{10-11}$. A. $\frac{3}{8}$. Cæc. pylor. 7.

The height of the body is nearly equal to the length of the head, and contained $3\frac{1}{4}$ in the total. Snout as in *Th. theraps.* Teeth of the vomer and the palatine bones distinct. Præoperculum equally serrated; operculum with two spines, the lower of which is the longest. The dorsal fin deeply notched, the caudal emarginate. Pale blackish silvery, with two broad, longitudinal lighter bands; the spinous portion of the dorsal fin blackish between the third and seventh spines; the caudal fin with two oblique black bands on each lobe.

Sea of Pinang.

The fish described by Bleeker (*Perc.* p. 51) under the name of *Th. obscurus* cannot belong to this species.

3. Therapon squalidus.

Cuv. & Val. iii. p. 136.

D. $\frac{12}{10}$. A. $\frac{3}{8}$. Cæc. pylor. 13.

Very similar to *Th. obscurus.* The height of the body is nearly equal to the length of the head, and contained about $3\frac{1}{3}$ in the total. Snout as in *Th. theraps.* Præoperculum angular, equally serrated; operculum with two spines, the lower of which is the longest. The dorsal fin is deeply notched, the caudal emarginate. Pale bluish silvery, with two broad silvery longitudinal bands; the spinous portion of the dorsal fin with a large blackish spot; the caudal fin with two narrow oblique black bands on each lobe. (*Cuv.*)

Indian Ocean.

Therapon transversus, Cuv. and Val. iii. p. 137, with indistinct cross-bars and eleven pyloric appendages, may prove to be identical with the former.

4. Therapon virgatus.

Datnia virgata, *Cuv. & Val.* vii. p. 480.

D. $\frac{12}{12}$. A. $\frac{3}{8}$.

Very similar to *Th. obscurus.* No teeth on the palate; the spinous teeth of the præoperculum and the opercular spine very strong. Three longitudinal bands; each lobe of the caudal with two oblique streaks; the spinous dorsal with a blackish blotch, the soft portion and the anal with two brown spots. (*Val.*)

Bay of Bengal.

5. Therapon ellipticus.

Datnia elliptica, *Rich. Voy. Ereb. & Terr. Fishes,* p. 118. pl. 52. f. 4–8.

D. $\frac{12}{11-13}$. A. $\frac{3}{8}$. L. lat. 85. L. transv. 17/31.

The height of the body is $3\frac{2}{3}$ in the total length, the length of the head $4\frac{1}{3}$. The snout moderately pointed. No teeth on the vomer or palate. Præoperculum serrated posteriorly and inferiorly, with the angle scaleless; præorbital serrated; two opercular spines, the lower of which is the broader and longer. Dorsal fin nearly even; caudalis emarginate. Uniform.

Rivers of Western Australia,

a. 17″ long: stuffed. Australia.—Type of the species.
b. Adult: skin. River Namoi (Australia).

6. Therapon cancellatus.

Datnia cancellata, *Cuv. & Val.* iii. p. 144; *Bleeker, Celebes,* vii. p. 438.

B. 6. D. $\frac{12}{10}$. A. $\frac{3}{8}$. L. lat. 50.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $3\frac{5}{6}$; the diameter of the eye is $3\frac{1}{2}$–$3\frac{2}{3}$ in the latter. The upper maxillary reaches nearly to the anterior margin of the eye. Snout scarcely longer than the diameter of the eye. The angle of the præoperculum with spinous teeth; operculum with two spines, the lower of which is much the longer. The fourth dorsal spine less than one-half of the depth of the body, and equal to the second of the anal fin. Caudal scarcely emarginate, with a pointed upper lobe and a rounded lower one. Above greenish, with brownish cross-bands on the back; three brownish longitudinal bands below the lateral line, the lower of which is formed by spots. The spinous dorsal with a black margin; the anal and ventral fins with a large blackish basal blotch.

Seas of Java and Celebes.

7. Therapon cinereus.

? Therapon cinereus, *Cuv. & Val.* iii. p. 138.

D. $\frac{12}{10}$. A. $\frac{3}{8}$. L. lat. 55. L. transv. 11/18.

The height of the body is $3\frac{1}{3}$ in the total length, the length of

the head $3\frac{2}{3}$. The interspace between the eyes equals nearly the diameter of the eye; the snout is a little longer. Præoperculum rounded, with moderate denticulations, gradually becoming larger towards the angle. Operculum with two spines, the lower of which is very long and strong. Spines of moderate strength; the fourth of the dorsal more than one-half the length of the head, and the twelfth much longer than the preceding. The third spine of the anal longer than the second. Caudalis scarcely emarginate. Cheeks with five or six series of scales. Coloration uniform; a black blotch between the third and sixth spines.

India.

a. Adult. India. Old Collection, with the name of *Perca argentea*.

8. **Therapon unicolor.** (Plate XVI. fig. A.)

D. $\frac{12}{10}$. A. $\frac{3}{8}$. L. lat. 50. L. transv. 9/20.

The height of the body is four times in the total length, the length of the head $4\frac{1}{2}$; the interspace between the eyes is more than their diameter, and the snout is still longer. Præoperculum rounded, finely serrated; præorbital and coracoid indistinctly denticulated. Operculum with two spines, the lower of which is slightly pointed. Spines of the dorsal rather feeble; the sixth is the longest, and $3\frac{3}{4}$ in the length of the head. Caudal truncated, with rounded angles Cheeks with small scales, forming many series. Greyish, each scale with darker margin.

Fresh waters of New South Wales.

a–d. Adult: skins. Head of Mosquito Creek, near Darling Downs.
e–k. Adult: skins. Gwydir River.

Description.—The height of the body is one-fourth of the total length. The head is slightly compressed, its width between the orbits being one-fourth of its length, which is $3\frac{1}{2}$ in the total. The upper surface of the head is flat and entirely scaleless. The snout is of moderate length, the upper maxillary reaching beyond the anterior margin of the eye. The præorbital is quadrangular, not much narrower posteriorly than anteriorly; it has the lower edge indistinctly denticulated. The eye is situated high up the sides, rather small, taking one-sixth of the length of the head. The scales of the cheeks are small, and arranged in about nine series between the orbit and the angle of the præoperculum. The naked margin of the præoperculum is narrow, the angle rounded; the posterior limb finely serrated, and longer than the lower, which is entire. The scales of the opercles are intermediate in size between those of the cheek and of the body. The operculum has two points, with a notch between; the upper is very obtuse, the lower spinous and rather prominent. The sub- and interoperculum do not show any denticulation; the suprascapula is not visible, whilst the coracoid is very broad, scaly, and denticulated at its posterior margin.

The spines of the *dorsal* fin are feeble and rather low: the first is one-half of the second; the sixth is the longest, $3\frac{3}{4}$ in the length of the head; the twelfth longer than the eleventh. The soft portion of the dorsal is more elevated and rounded; the distance between the dorsal and caudal fins is less than the height of the tail below the end of the dorsal. The *caudal* is rather short, truncated, and has the angles rounded. The origin of the *anal* falls somewhat behind the vertical from the origin of the soft dorsal, whilst the ends of both correspond to each other; the spines are moderately strong; the first is one-half of the second, which is stronger, but not longer than the third; the soft portion is lower than the corresponding dorsal fin. The *pectorals* are rounded, very short, and $8\frac{1}{2}$ in the total length. The *ventrals* are inserted immediately behind the pectorals, and rather longer, their length being one-seventh of the total.

The *scales* are of moderate size, minutely ciliated; those of the belly are very small. The lateral line is nearly straight, slightly bent downwards beneath the soft dorsal.

The *teeth* form villiform bands, with an outer series of stronger ones; there are no teeth on the palate.

The fishes are now uniform greyish, silvery shining; each scale has the margin darker.

	inches.	lines.
Total length	7	0
Height of the body	1	10
Length of the head	2	0
Distance between the eyes	0	6
Diameter of the eye	0	4
Length of the sixth dorsal spine	0	$6\frac{1}{2}$
Height of the soft dorsal	0	9
Length of the caudal	1	1
——— of the second anal spine	0	$5\frac{1}{2}$
Height of the soft anal	0	8
Length of the pectoral	0	10
——— of the ventral	1	0

9. Therapon servus.

Sciæna jarbua, *Forskal, Descr. Anim.* p. 50; *Shaw, Zool.* iv. p. 541.
Holocentrus servus, *Bloch,* t. 238. f. 1.
—— jarbua, *Lacép.* iv. pp. 348, 355.
Grammistes servus, *Bl. Schn.* p. 185.
Therapon timoriensis, *Quoy & Gaim. Voy. Freyc. Poiss.* p. 341.
—— servus, *Cuv. & Val.* iii. p. 125, vii. p. 479; *Bleeker, Perc.* p. 50; *Richardson, Ann. & Mag. Nat. Hist.* 1842, vol. ix. p. 126; *Rüpp. N. Wirb. Fische,* p. 95.
Pterapon trivittatus, *Gray, Ind. Zool.* pl. . f. 1.

D. 11* | $\frac{1}{10}$. A. $\frac{3}{8}$. L. lat. 80. Vert. 10/15.

The height of the body is nearly equal to the length of the head, and is contained $3\frac{3}{4}$ in the total length. The snout is a little longer than the interspace between the eyes is broad. Præoperculum rounded, serrated, with strong spinous teeth at the angle; operculum with two spines, the lower of which is elongate and strong. Greenish grey, with three curved, brown, longitudinal bands, the convexity of which is towards the belly; the inferior extends from the head to the tail; the spinous portion of the dorsal fin blackish between the fourth and seventh spines; two blackish bands obliquely crossing each lobe of the caudal.

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* The first spine is minute and scarcely visible in young specimens.

From the Red Sea along the Eastern Coasts of Africa through all the Indian Seas to the North Coast of Australia; entering fresh waters.

a. Adult and half-grown: stuffed. Port Essington (fresh water).
b, c. Adult: stuffed. Cape York. Voyage of the Rattlesnake.
d–f. Fine specimens. Amboyna. From Mr. Frank's Collection.
g. Adult. Moluccas. From the Leyden Museum.
h. Adult. Moluccas.
i. Adult. China. Presented by J. R. Reeves, Esq.
k. Adult: skeleton. China.
l. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
m. Half-grown. China. Presented by Capt. Sir Edward Belcher.
n. Half-grown: skin. China. From Mr. Warwick's Collection.
o, p. Young. China. Presented by Capt. Sir Edward Belcher.
q, r. Half-grown: not good state. Madras. Presented by J. C. Jerdon, Esq.
s, t. Half-grown: not good state. Madras. Presented by J. C. Jerdon, Esq.
u, v. Young. Fresh water of Point de Galle (Ceylon). Presented by Sir A. Smith.
w. Adult: stuffed. Red Sea.
x, y. Half-grown: stuffed. Cape Seas. Presented by Sir A. Smith.
z. Half-grown. India. With the name of *Perca cincta.*
α. Half-grown. India. With the name of *Perca cincta.*
β. Half-grown. India. Presented by G. R. Waterhouse, Esq
γ. Half-grown. India.
δ. Young: not good state. India.
ε–θ. Young. India.
ι. Young. India. From the Haslar Collection.
κ. Half-grown: stuffed. (Nepal?) Presented by B. H. Hodgson, Esq.

Skeleton.—The skeleton of *Therapon* differs in nothing particularly from that of the Percine type, and does not yet show those developed grooves on the skull of the true *Sciænidæ.* The upper surface of the skull is continued, in a straight line, into the occipital crest, which, well developed, exhibits a strong and thick ridge. The frontal bones are flat and broad, without sharp ridges, tapering from the anterior angle of the orbit, and truncated in front. The præorbital is broad, irregularly quadrangular, with the lower margin denticulated; the remainder of the infraorbital arch is very narrow; the bone next to the præorbital has at its inner side a broad plate, joining the entopterygoid and supporting the eyeball from beneath. The maxillary is moderately widened behind; the intermaxillary has a broad band of villiform teeth in front, and several larger ones in its external series; the villiform band is very narrow on the lateral parts of the bone. The villiform band of the mandibula is much narrower; but there is an external series of teeth, rather larger and more numerous than in the upper jaw. There is a very narrow transverse band of exceedingly fine teeth on the vomer. The pharyngeal bones are separated from each other, the upper as well as the lower ones; they are armed with villiform teeth.

The operculum is distinguished by a very long and strong spinous process, longer than its greatest width; there is another small one above. Suboperculum narrow, with a small notch to receive a limb of the coracoid; not serrated. Interoperculum shorter and broader, with the lower limb distinctly serrated. The axes of the two limbs of the præoperculum form a very obtuse angle; they are represented by a thick ridge, from which striæ radiate, terminating in strong spines; there are about fifteen spines round the edges of the bone, two of which (at the angle) are strongest; those of the lower limb are very feeble. The suprascapula and the coracoid are distinctly denticulated, and the latter exhibits flat striæ besides. The pubic bones are shaped as in the *Percina*; namely, each is formed by three plates, the internal thinnest, broadest, and closely joined to that of the other side. The two other plates, situated in one plane vertical to the third, are low.

There are ten abdominal and fifteen caudal vertebræ. The fourth has a broad process, to which the air-bladder is fixed. The second rib is remarkably broad in its upper half. The first interhæmal is of moderate strength, equal to the length of the second vertebra to the seventh, and is fixed to the hæmals of the eleventh and twelfth.

10. **Therapon trivittatus.**

Russell, ii. pl. 126.
Coius trivittatus, *Buch. Ham.* pp. 92, 370.
Therapon puta, *Cuv. & Val.* iii. p. 131; *Bleek. Perc.* p. 50; *Cuv. Règne Anim. Ill. Poiss.* pl. 12. f. 2.
—— trivittatus, *Cant. Catal.* p. 19.

D. $\frac{12}{10}$. A. $\frac{3}{9}$. L. lat. 90–100. Cæc. pylor. 7. Vert. 10/15.

The height of the body is $3\frac{3}{4}$–$4\frac{1}{4}$ in the total length, the length of the head $4\frac{1}{4}$. The snout is $1\frac{1}{3}$ the interspace between the eyes. Præoperculum serrated, with very long spinous teeth at the angle; operculum with two spines, the lower of which is elongate and strong. Greenish grey, with three straight brown longitudinal bands, the inferior of which extends from the eye to the tail; the spinous portion of the dorsal fin blackish between the third and eighth spines; two blackish bands obliquely crossing each lobe of the caudal.

Indian Seas.

a. Adult: skeleton. India. From Mr. Frank's Collection.
b. Adult. Ceylon. From Mr. Cuming's Collection.

c. Young. Singapore.
d. Adult. Moluccas.
e. Adult. Purchased of M. Parzudaki.
f. Air-bladder of specimen *a*.

Skeleton.—The general structure being the same as in *Th. servus*, I only give descriptions of those parts which show the specific difference. The breadth of the frontal bones between the eyes is narrower; these bones do not taper in front, but show a sinuous lateral margin from the angle of the orbit. The teeth in the external series of the intermaxillary are scarcely larger than those of the villiform band behind, and very numerous; the lower jaw has no larger teeth whatever. Vomer edentulous. Suboperculum without notch, interoperculum not denticulated. The angle of the præoperculum is still more obtuse; the axis of the lower limb is prolonged into a long spine, not much smaller than that of the operculum; there are two smaller spines above this long one, directed upwards, and two below, directed backwards; all the lower limb is finely serrated. The fourth vertebra shows the same peculiarity as in the preceding species; but not the second rib, which is like the succeeding ones.

11. Therapon ghebul.

Therapon ghebul, (*Ehrenberg*) *Cuv. & Val.* iii. p. 133; *Bleeker, Perc.* p. 51.

D. $\frac{12}{10}$. A. $\frac{3}{10\ (Cuv.\ 9)}$. L. lat. 90–100.

The height of the body is equal to the length of the head and $4\frac{1}{4}$–$4\frac{1}{3}$ in the total. Snout as in *Th. trivittatus*. Præoperculum serrated, with long spinous teeth at the angle; operculum with two spines, the upper of which is short, the lower moderately long. Greenish, with four straight brown longitudinal bands, the third of which extends from the muzzle to the tail; the spinous portion of the dorsal fin blackish between the third and eighth spines; two blackish cross-bands obliquely crossing each lobe of the caudal.

Red Sea; Javanese Sea.

12. Therapon oxyrhynchus.

Temm. & Schleg. Faun. Japon. p. 16. pl. 6. f. 3; *Richards. Ichthyol. China*, p. 239; *Bleek. Verhand. Batav. Genootsch.* xxvi. p. 64.

D $\frac{12}{10}$. A. $\frac{3}{8}$. L. lat. 55–60. L. transv. 15/25. Vert. 10/15.

The height of the body is equal to the length of the head (opercular spine included) and $3\frac{1}{2}$ in the total; the snout is nearly twice as long as the interspace between the eyes is broad. Præoperculum rounded, with long spinous teeth behind, longest at the angle, smallest at the lower margin. Operculum with two spines, the lower of which is elongate. Greenish grey, with four brown longitudinal bands, the third running from the snout through the eye to the root of tail; the dorsal fin with two brown bands, one along the base, the other along the upper margin of the spinous portion.

Japanese and Chinese Seas.

a. Skin, in spirits. Japan. From Mr. Frank's Collection.
b. Adult: stuffed. Japan.
c. Adult. China.
d. Adult. China.
e. Adult. India. From the Haslar Collection.
f. Adult (has been dried). India. Presented by the Zoological Society.
g. Adult: skeleton: not good state. India. Presented by the Zoological Society.

Skeleton.—This species has the same dentition of the jaws as *Th. trivittatus.* The vomer has a prominent transverse ridge, but I cannot find any teeth. The angle of the præoperculum is as obtuse as in *Th. trivittatus,* but the spinous teeth of the posterior limb and of the angle are more numerous and more equal; there are about nine above the longest at the angle, more or less directed upwards; then follow several smaller ones; and the greater part of the lower limb shows a fine serrature. The other parts of the skeleton are very much like *Th. trivittatus.*

13. **Therapon quadrilineatus.**

Holocentrus quadrilineatus, *Bloch,* t. 238. f. 2.
Therapon quadrilineatus, *Cuv. & Val.* iii. p. 134; *Bleeker, Perc.* p. 51; *Richards. Ichth. China,* p. 239.
—— xanthurus, *Cuv. & Val.* iii. p. 135.

D. $\frac{12}{(9)\ 10}$. A. $\frac{3}{10}$. L. lat. 65.

The height of the body is equal to the length of the head, and one-fourth of the total. Snout as in *Th. trivittatus.* Præoperculum serrated, with stronger teeth at the angle; operculum with two moderate spines, nearly equal in length. Dorsal fin not very deeply notched. Caudal truncated, with rounded angles. Greyish, with four straight, brown, longitudinal bands; the spinous portion of the dorsal fin black-edged, and with a blackish spot between the third and seventh spines; caudal fin immaculate.

Javanese and Chinese Seas.

14. **Therapon cuvieri.**

Pristipoma sexlineatum, *Quoy & Gaim. Voy. Freyc. Poiss.* p. 320.
Pelates sexlineatus, quadrilineatus, et quinquelineatus, *Cuv. & Val.* iii. p. 146. pl. 55; *Less. Voy. Coq. Zool.* ii. p. 223; *Cuv. Règne Anim. Ill. Poiss.* pl. 12. f. 1.
Therapon cuvieri, *Bleek. Nat. Tydschr. Nederl. Indie,* vi. p. 211.

D. $\frac{12}{10}$. A. $\frac{3}{10}$. L. lat. 66. L. transv. 12/23. Cæc. pylor. 6.

The height of the body is $3\frac{1}{2}$ in the total length, the length of

the head $4\frac{1}{4}$; the diameter of the eye is nearly five times in the length of the head, and $1\frac{3}{4}$ in that of the snout. Præoperculum finely and equally serrated throughout; opercular spines very feeble. No vomerine or palatine teeth. Dorsal scarcely notched, with slender spines; the fifth and sixth are longest, their length being $2\frac{1}{2}$ in the depth of the body; the last two spines much longer than the first two; anal spines feeble. Caudal very slightly notched. Four, five, or six longitudinal bands; fins immaculate.

Coasts of Australia; Sea of Timor.

a. Half-grown: skin. N. S. Wales.
b. Half-grown: skin. Port Jackson. From Mr. Gould's Collection.
c. Adult. Sydney. From the Haslar Collection.
d. Adult. Sydney. From the Haslar Collection.
e. Adult: skin. Port Essington. From Mr. Macgillivray's Collection.
f. Adult. Australia. From the Haslar Collection.
g. Adult. Australia. From the Haslar Collection.
h. Adult. Australia. From Mr. Gould's Collection.
i. Adult: stuffed. Australia. From Mr. Warwick's Collection.

15. Therapon argenteus.

Datnia argentea, *Cuv. & Val.* iii. 139. pl. 54; *Bleeker, Perc.* p. 52.
Mesopristes macracanthus, *Bleeker, Topogr. Batav.*
Datnia cancellatoides, *Bleek. Sumatra*, i. p. 5 (young with longitudinal bands).

Cuvier quotes to this species *Coius datnia*, Ham. Buch. Gang. Fish. p. 88. pl. 9. f. 29, creating for this species the generic name of *Datnia*. By comparing Buchanan's figure of the fish, and still more his description, one may easily see that this is quite a different fish. Hamilton's figure has thirty-three scales in the lateral line; Cuvier's fish has nearly sixty. Ham. Buch. describes the posterior teeth as "blunt and crowded together; the palate is smooth, and has behind the teeth a short membranous veil; above each ventral fin is a long scale-like appendant." Neither such a membranous veil nor such an appendix is to be found in Cuvier's fish; and this species of Ham. Buch. is identical with *Sparus hasta*, Schneid., or *Chrysophrys longispinis*, Cuv. & Val., *Chrysophrys hasta*, m.

B. 6. D. $\frac{12}{10}$. A. $\frac{3}{8}$. L. lat. 56. L. transv. 25. Cæc. pylor. 11.

The height of the body is more than one-third of the total length, the length of the head nearly one-fourth; the diameter of the eye is $3\frac{1}{2}$ in the latter. The upper maxillary does not reach to the anterior margin of the eye; snout much longer than the diameter of the eye. Suprascapulary and coracoid serrated; operculum with two spines, the lower of which is the longer. The fourth and fifth dorsal spines longest, longer than half the height of the body; the second anal spine still stronger and longer. Caudal slightly notched. Scales very finely serrated. Silvery, darker on the back; the spinous dorsal with a narrow black edge; the soft anal with a blackish blotch.

Cape Sea; Indian Ocean; Molucca Sea.

a. Adult. Amboyna. From Mr. Frank's Collection.
b. Half-grown. Amboyna. From Mr. Frank's Collection.
c. Adult. India.
d Adult: stuffed: not good state. Cape Seas.

16. Therapon caudovittatus.

Datnia caudavittata, *Richards. Voy. of the Erebus and Terror, Fishes*, p. 24. pl. 18. f. 3–5.

D. $\frac{13}{9}$. A. $\frac{3}{8}$. L. lat. 46.

Snout rather longer than the diameter of the eye; præoperculum rounded, finely and equally denticulated. Opercular spines flat and rather short. Dorsal scarcely notched: the last spines as long as the first rays; the fourth, fifth and sixth dorsal spines longest, half as high as the body, slender; the second anal spine rather stronger than the third. Spotted with greyish brown: each lobe of the caudal with one broad deep-black band.

Rivers of Australia.

a. Adult. Antarctic Expedition. Presented by the Lords of the Admiralty.
b, *c*. Fine specimens: stuffed. Victoria. Voyage of H. M. S. Herald.
d, *e*. Adult: stuffed. Cape York. Voyage of the Rattlesnake.
f–*h*. Adult: skins: not good state. Harvey River (fresh water), Western Australia.
h. Adult: not good state. From the Haslar Collection.

The contraction of the *air-bladder* in this species is as conspicuous as in any other *Therapon*; it has been overlooked by Sir J. Richardson, who describes the air-bladder as undivided, and separates *Th. caudovittatus* from this genus.

2. HELOTES.

Helotes, *Cuv. Règne Anim*; *Cuv. & Val.* iii. p. 149.

Six branchiostegals. Eye of moderate size. Cleft of the mouth rather small; jaws nearly equal. Teeth: none on the vomer or the palatine bones; those of the outer rows with a small lobe on each side. Operculum with feeble spines; præoperculum denticulated. Dorsal not deeply notched, with twelve spines, anal with three. Scales small, ctenoid. Air-bladder separated by a contraction into an anterior and posterior portion. Cæca pylorica in moderate number.

From the Molucca Sea to Australia.

1. Helotes sexlineatus.

Therapon sexlineatus, *Quoy & Gaim. Voy. Freyc. Poiss.* pl. 60. f. 1.
Helotes sexlineatus, *Cuv. & Val.* iii. p. 149. pl. 56; *Bleek. Natuurk. Tydschr. Nederl. Ind.* 1851, p. 171; *Cuv. Règne Anim. Ill. Poiss.* pl. 12. f. 3.

D. $\frac{12}{10}$. A. $\frac{3}{10}$. L. lat. 110. L. transv. 35. Cæc. pylor. 15. Vert. 10/15.

The height of the body equals the length of the head, and is 4½ in the total. Teeth with distinct lobes. Operculum with two short spines, the lower of which is somewhat prominent; præoperculum rounded, denticulated. The fifth and sixth dorsal spines longest. Six blackish-brown longitudinal bands on each side.

Australian Coasts.

2. Helotes octolineatus.

Jenyns, Zool. Beagle, Fishes, p. 18.

D. $\frac{12}{9}$. A. $\frac{3}{7}$.

The height of the body is nearly equal to the length of the head, and 4½ in the total. Jaws equal. Teeth distinctly three-pointed. Operculum with two spines, the lower of which is prominent. Eight blackish-brown longitudinal bands on each side. (*Jen.*)

King George's Sound (S. W. Coast of Australia).

3. Helotes polytænia.

Bleeker, Halmaheira, p. 53.

D. $\frac{12}{10}$. A. $\frac{3}{10}$. L. lat. 75. L. transv. $\frac{14}{24}$.

The height of the body is four times in the total length, the length of the head 4½; the diameter of the eye is 3½ in the latter. Teeth with rather indistinct lateral lobes. Operculum with two flat, short spines; præoperculum rounded nearly throughout, denticulated. The fifth and sixth dorsal spines longest, half as high as the body, the two posterior ones much longer than the two anterior. A black blotch above the lateral line near the nape; (ten or twelve) brown longitudinal bands on the sides.

Sea of Halmaheira.

a. Adult.—It is not without doubt that I refer this specimen to the above species, as it has six longitudinal bands only, and a black blotch on the dorsal. In other points it agrees with Bleeker's description.

3. MACQUARIA.

Macquaria, *Cuv. & Val.* v. p. 377.

Form of the body oblong, compressed; eye moderate; cleft of the mouth nearly horizontal, with the jaws equal. One dorsal, with eleven spines, anal fin with three; all the spines strong. No teeth in the jaws or on the palate. Branchiostegals five. Both limbs of the præoperculum serrated; operculum with two points. Scales moderate, ctenoid. Air-bladder simple; pyloric appendages in moderate number.

Freshwater fish from Australia.

1. Macquaria australasica.

Cuv. & Val. l. c. pl. 131; *Less. Voy. Coq. Zool.* ii. p. 194. pl. 14. f. 1.

D. $\frac{11}{11}$. A. $\frac{3}{8}$. L. lat. 65–66. Cæc. pylor. 3.

Externally very similar to *Dules ambiguus.* Snout scaleless. The fourth and fifth dorsal spines longest; the second of the anal fin much longer and stronger than the third. Uniform brownish.

Macquarie River.

4. PRISTIPOMA[*].

Pristipoma, *Cuv. Règne Anim.*; *Cuv. & Val.* v. p. 243.

Form of the body oblong, compressed. Eye moderate. Cleft of the mouth horizontal, not very wide, with the jaws nearly equal; a central groove below the chin[†]. One dorsal, with eleven to fourteen spines, the anal with three; vertical fins not scaly, or with scales on the basal portions only. Villiform teeth in both the jaws, without canines; none on the palate. Branchiostegals seven. Præoperculum serrated; operculum with very indistinct points. Scales moderate, ctenoid. Pseudobranchiæ. Air-bladder simple; pyloric appendages in small number.

All the Tropical Seas, extending into the Japanese Seas and the Mediterranean.

1. Pristipoma cavifrons.

? Lutjanus luteus, *Bl.* taf. 247.
? Grammistes hepatus, *Bl. Schn.* p. 187.
Diagramma cavifrons, *Cuv. & Val.* v. p. 290. pl. 123.

B. 7. D. $\frac{13}{13}$. A. $\frac{3}{9}$. L. lat. 50. Vert. 10/16.

The height of the body is one-third of the total length, the length of the head one-fourth. Snout short, cleft of the mouth small. The upper margin of the orbits is elevated, and renders the space between concave. Præoperculum serrated throughout. Dorsal fin notched, with long and strong spines. Caudalis emarginate; the second anal spine very strong, and much longer than the third. Coloration uniform.

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[*] 1. Pristipoma rangii, *Cuv. & Val.* ix. p. 484.—Cape Verde.
2. —— jubelini, *Cuv. & Val.* v. p. 250.—Cape Verde; Senegal.
3. *Russell*, pl. 132.—Pristipoma guoraka, *Cuv. & Val.* v. p. 256, *cop. in Bélang. Voy.* p. 363; *Cant. Catal.* p. 73.
4. Pristipoma? chloronotum, *Richards. Ichth. China*, p. 228.—Canton.
5. ——? gallinaceum, *Richards. Ichth. China*, p. 228.—Canton.
6. ——? grammopœcilum, *Richards. Ichth. China*, p. 228.—Canton.
7. —— leucurum, *Cuv. & Val.* ix. p. 488.—Seychelles.
Cfr. Pristipoma cavifrons.

Atlantic coasts of Tropical America.

a. Adult: skin. West Indies. Purchased of Mr. Scrivener.

This species is said to have no groove below the chin, and has been placed in *Diagramma* by Cuvier, but it is closely allied to the following species.

2. Pristipoma serrula.

Cuv. & Val. v. p. 272; *Ramon de la Sagra, Hist. Cuba, Poiss.* p. 70.

D. $\frac{12}{13}$. A. $\frac{3}{9}$.

The height of the body is one-third of the total length; the snout short, not longer than the width of the eye. Dorsal fin very deeply notched, with feeble spines; the second and third anal spines equal in length. Back with four or five yellow longitudinal lines. (*Cuv.*)

Martinique.

Pristipoma auratum, Cuv. & Val. *l. c.*, with uniform coloration, may be only a variety of the above species.

3. Pristipoma melanopterum.

Pristipoma melanopterum, *Cuv. & Val.* v. p. 273.
? Pristipoma bilineatum, *Cuv. & Val.* v. p. 271. pl. 122.

D. $\frac{12}{17\text{–}18\ (15)}$. A. $\frac{3}{8\text{–}9}$. L. lat. 50. L. transv. 9/14.

The height of the body is $2\frac{2}{3}$ in the total length, the length of the head $3\frac{2}{3}$. The snout is obtuse, rather shorter than the diameter of the eye, which is one-third of the length of the head. The cleft of the mouth is narrow, the upper maxillary reaching to the vertical from the front margin of the eye. Præoperculum with the posterior limb very slightly emarginate, and with rather stronger denticulations at the angle. The dorsal fin deeply notched, with strong spines; the third longest, one-half the length of the head. Caudalis emarginate; the second anal spine exceedingly strong, and much longer than the third of the dorsal fin. Vertical fins scaly on one-half their height. On each side two parallel brown bands, one above the lateral line, the other from the eye to a round spot at the root of the caudal; the fins blackish. Coloration in old age uniform, with blackish fins.

Coasts of Tropical America.

a. Fine specimen. Rio Janeiro. Presented by A. Fry, Esq.
b. Adult: skin. Jamaica. From Dr. Parnell's Collection.

I should without any hesitation consider *P. bilineatum* as the younger state of *P. melanopterum*, if Cuvier had not stated fifteen soft rays in the dorsal fin of the former. On the other hand, specimen *a*, which is not full-grown, has seventeen rays, and the exact coloration given by Cuvier of *P. bilineatum*.

Likewise *Pristipoma bicolor* (Castelnau, Anim. nouv. ou rares, Amér. Sud, p. 8. pl. 2. f. 2) may prove to be a variety only of the above species, or the type of the species itself, but with the coloration made from life.

4. Pristipoma virginicum. =

Margrave, p. 152 (Acara pinima), and p. 148 (Guatucupa juba).
Sparus virginicus, *Linn. Gmel.* p. 1278; *Bl. Schn.* p. 274.
—— vittatus, *Bl.* taf. 263. f. 2 (not taf. 275).
Perca juba, *Bl.* taf. 308. f. 2 (very bad).
Grammistes mauritii, *Bl. Schn.* p. 185.
—— juba, *Bl. Schn.* p. 184.
Lutjanus virginicus, *Lacép.* iv. pp. 197, 199.
Sparus jub, *Lacép.* iv. pp. 43, 138.
Pristipoma rodo, *Cuv. & Val.* v. p. 274.

D. $\frac{12}{15-17}$. A. $\frac{3}{10}$. L. lat. 56. L. transv. 14/16.

The profile of the head and nape very steep. The height of the body is 2½ in the total length, the length of the head four times. The cleft of the mouth is small, the upper maxillary not extending to the anterior margin of the orbit. The portions of the dorsal fin scarcely separated by a slight notch; the spines stout, the longest shorter than the second of the anal, which is one-half the length of the head. Caudalis deeply notched. An oblique brown band from the nape through the eye to the angle of the mouth; another, more vertical, from the origin of the dorsal to the root of the pectoral; behind this cross-band six parallel bluish longitudinal bands.

Atlantic coasts of Tropical America.

a, b. 13″ long: skins. Jamaica. From Dr. Parnell's Collection.
c. Adult: skin. Jamaica. From Dr. Parnell's Collection.
d. Adult. S. America. Presented by Sir R. Schomburgk.
e. Half-grown. From the Collection of the Zoological Society.
f, g. Half-grown. From the Collection of the Zoological Society.
h. Adult. From the Haslar Collection.
i. Half-grown. From the Haslar Collection.
k, l. Adult: stuffed.
m, n. Adult: stuffed. Old Collection.

5. Pristipoma surinamense.

Lutjanus surinamensis, *Bloch*, taf. 253.
Holocentrus gibbosus, *Lacép.* iv. pp. 344, 391.
Pristipoma surinamense, *Cuv. & Val.* v. p. 273.

D. $\frac{14}{16}$. A. $\frac{3}{7}$.

The height of the body is one-third of the total length. The snout is short, not longer than the width of the eye. Dorsal fin notched; the fourth spine longest; the second anal spine strong. Caudalis somewhat rounded. Body with irregular blackish cross-bars.

Surinam.

6. Pristipoma nigrum.

Pristipoma nigrum, (*Mertens*) *Cuv. & Val.* v. p. 258; *Cant. Catal.* p. 74.

B. 7. D. $\frac{14}{16}$. A. $\frac{3}{7}$.

The height of the body is three times in the total length, the length of the head $3\frac{3}{4}$; eye one-third of the latter. Blackish brown.

Sea of Pinang; Manilla.

7. Pristipoma hasta.

Lutjanus hasta, *Bloch*, taf. 246. f. 1; *Bl. Schn.* p. 324; *Lacép.* iv. p. 229.
Labrus commersoni, *Lacép.* iii. pp. 431, 477. pl. 23. f. 1; *Shaw, Zool.* iv. p. 493.
Lutjanus microstoma, *Lacép.* iii. pl. 34. f. 2, iv. pp. 181, 216.
Pristipoma kakaan, *Cuv. & Val.* v. p. 244; *Rüpp. N. W. Fische*, p. 123. t. 20. f. 1; *Richardson, Ichth. China*, p. 227; *Bleek. Verh. Bat. Genootsch.* xxii. p. 3.
—— commersonii, *Cuv. & Val.* v. p. 252; *Cant. Catal.* p. 72.
—— hasta, *Cuv. & Val.* v. p. 247, *cop. in Bélanger, Voy. Ind. Orient.* p. 362; *Bleek. l. c.* xxiii. *Sciæn.* p. 20.
—— chrysobalion, (*Kuhl & v. Hasselt*) *Cuv. & Val.* v. p. 248.

D. $11 \big| \frac{1}{14}$. A. $\frac{3}{7-8}$. L. lat. 47. L. transv. 6/10. Cæc. pylor. 6.

The height of the body is 3 to $3\frac{1}{2}$ in the total; the length of the head is sometimes equal to that height, sometimes less; the snout is a little longer than the width of the eye, the diameter of which is $4\frac{1}{3}$ in the length of the head. Jaws equal; the upper maxillary reaches to the level of the anterior margin of the orbit. The posterior limb of the præoperculum emarginate, its angle rounded, produced and denticulated. The fourth dorsal spine longest, longer than half the length of the head; the dorsal fins separated by a more or less deep notch. Caudalis truncated; the second anal spine very strong, but shorter than the longest of the dorsal fin*; pectoral pointed, elongate, its length being $3\frac{1}{2}$ in the total. Back and upper part of the sides with brown spots, more or less regularly arranged, sometimes forming longitudinal series, sometimes cross-bars; both the dorsal fins with two or three series of round brown spots.

From the Red Sea along the east coast of Africa through all the Indian Seas to the northern shores of Australia.

a. Adult: stuffed. Red Sea. From the Frankfort Museum.
b. Adult. India. Purchased of Mr. Frank.
c. Adult: skin. India. Presented by B. H. Hodgson, Esq.
d. Half-grown: not good state. India. From the Haslar Collection.
e. Adult. China.
f. Adult. China.
g. Adult: not good state. China.
h. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
i. Half-grown. China. Presented by J. R. Reeves, Esq.
k. Half-grown. China.

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* In young specimens the anal spine is as long as the fourth of the dorsal fin.

l. Half-grown. China.
m, n. Young. China.
o. Half-grown. Philippine Islands.
p. Half-grown. Moluccas.
q. Half-grown. Moluccas. Purchased of Mr. Frank.
r. Half-grown. Amboyna. Purchased of Mr. Frank.
s. Half-grown. Ceram. Purchased of Mr. Frank.
t. Half-grown. Sumatra. Purchased of Mr. Frank.
u. 20″ long: stuffed. Cape York (69 fathoms). Voyage of the Rattlesnake.
v. Half-grown: bad state. North Australia. Presented by Dr. J. R. Elsey.

8. **Pristipoma nageb.**

Rüppell, N. W. Fische, p. 124. taf. 30. f. 2; ? *Richardson, Ichth. China,* p. 227; *Bleek. l. c.* xxiii. *Sciæn.* p. 21.

D. $11 \left| \frac{1}{14} \right.$. A. $\frac{3}{8}$. (L. lat. 40, *Bleek.*)

The height of the body is nearly equal to the length of the head, and $3\frac{1}{3}$ in the total. The snout is elongate, compressed; præoperculum slightly emarginate; dorsal fin deeply notched, with the spines of moderate strength, the fourth the longest. Caudalis truncated; the second anal spine longer and stronger than the third, but shorter than the highest of the dorsal. Silvery, with eight vertical bands, each formed by one or two series of blackish spots. Dorsalis with brownish spots.

Red Sea; Sunda Sea.

9. **Pristipoma punctulatum.**

Rüpp. N. W. Fische, p. 124. taf. 30. f. 3.

D. $\frac{12}{15}$. A. $\frac{3}{8}$.

The height of the body is $2\frac{3}{4}$ in the total length, the length of the head nearly four times. The snout and the cleft of the mouth are short; præoperculum slightly emarginate posteriorly. The dorsal and anal fins are low; the former is slightly notched, and has the third spine longest, which is one-third only of the height of the body; the second anal spine is still shorter, but very strong; the third much shorter and thinner. Caudalis truncated; pectoral elongate, $3\frac{1}{3}$ in the total length. Back and sides with blackish dots, forming undulating longitudinal lines; dorsal fin with longitudinal series of blackish spots.

Red Sea.

a. Fourteen inches long: stuffed. Isle de France. From Dr. Janvier's Collection.—This specimen agrees very well with the above description, taken from fishes of the Red Sea; but the second anal spine is rather longer than the third of the dorsal, and exceedingly strong. There are forty-eight transverse rows of scales, eight longitudinal ones above the lateral line, and sixteen below.

10. Pristipoma dussumieri.

Cuv. & Val. v. p. 259.

D. $\frac{12}{14}$. A. $\frac{3}{7}$. L. lat. 46. L. transv. 6/12.

The height of the body is nearly equal to the length of the head, and $3\frac{1}{3}$ in the total. The snout is scarcely longer than the diameter of the eye, which is nearly one-fourth of the length of the head. The cleft of the mouth is rather narrow, the upper maxillary scarcely reaching to the vertical from the front margin of the orbit. Præoperculum with the posterior limb slightly emarginate, and with the angle not projecting. The dorsal fin notched, with strong spines; the fourth the longest, $2\frac{1}{4}$ in the length of the head. Caudalis truncated. The second anal spine is exceedingly strong, much longer than the third, and at least as long as the longest of the dorsal. The length of the pectoral is one-fourth of the total.

Coast of Coromandel.

a. Adult: bleached. Old Collection, as *Perca corvina*.
b. Adult: bleached. Old Collection, as *Perca corvina*.
c. Adult: stuffed: not good state.

11. Pristipoma argenteum.

Sciæna argentea, *Forsk.* p. 51 (not *Gmelin*).
Pomadasis argenteus, *Lacép.* iv. p. 516.
Pristipoma argenteum, *Cuv. & Val.* v. p. 249; *Rüpp. N. W. Fische*, p. 123.

D. $\frac{12\text{–}13}{13\text{–}15}$. A. $\frac{3}{7\text{–}9}$. L. lat. 56. L. transv. 8/15.

The height of the body is $3\frac{1}{3}$ in the total length, the length of the head $3\frac{1}{2}$; the diameter of the eye is $1\frac{2}{3}$ in the length of the snout, and $4\frac{1}{2}$ in that of the head. The snout is elongate, the cleft of the mouth rather small, the upper maxillary not extending to the front margin of the orbit. The præoperculum slightly sinuous behind. The dorsal fin deeply notched, with spines of moderate strength; the fourth longest, $2\frac{1}{2}$ in the length of the head. Caudalis with rather elongate lobes, but nearly truncated when stretched out. The second anal spine not much stronger and scarcely longer than the third, shorter than the highest of the dorsal fin. Pectoral nearly one-fourth of the total length. Silvery, the upper two-thirds with brownish dots. Dorsal fin with a series of brownish spots along its base.

Red Sea.

a. Adult. From the Haslar Collection.
b. Adult: not good state. Coast of Africa. From the Haslar Collection.
c. Young.
d, *e*. Young: stuffed: bad state.

The specimens in the British Museum Collection are of unknown origin, and I doubt whether they came from the Red Sea; but they agree very well with *P. argenteum*, as far as the characters are given in the descriptions quoted.

12. **Pristipoma argyreum.**

Pristipoma argyreum, *Bleek. Verh. Bat. Gen.* xxiii. *Sciæn.* p. 22.
? Pristipoma argyreum, *Cuv. & Val.* ix. p. 485.

D. $\frac{12-13}{13}$. A. $\frac{3}{7}$. L. lat. 40.

The height of the body is $3\frac{1}{3}$ to $3\frac{1}{2}$ in the total length, and equal to the length of the head. The snout is much shorter than the eye, which is one-third of the length of the eye. Præoperculum slightly emarginate behind, with fine denticulations. The third and fourth dorsal spines longest, one-half of the height of the body. Caudalis truncated; the second anal spine one-seventh of the total length. Uniform silvery; operculum with an olive spot.

Coast of Coromandel; Sumatra; Batavia.

13. **Pristipoma pihloo.**

Richardson, Ichth. China, p. 227.

D. $\frac{11}{14}$. A. $\frac{3}{8}$.

Præoperculum with the posterior edge emarginate. The second anal spine longer and stronger than the third. A row of seven roundish dark spots or short transverse bars along the back above the lateral line. (*Richardson.*)

Canton.

The specimen on which this species was founded by Sir John Richardson appears to have been mislaid.

14. **Pristipoma paikeeli.**

Paikeeli, *Russell*, pl. 121.
Pristipoma paikeeli, *Cuv. & Val.* v. p. 259; *Cant. Catal.* p. 74; *Bleek. Verh. Bat. Gen.* xxiii. *Sciæn.* p. 20.

B. 7. D. $\frac{12}{15}$. A. $\frac{3}{9}$. L. lat. 55–60.

The height of the body is three times in the total length, the length of the head $3\frac{1}{2}$. Caudalis emarginate. Silvery brownish white; on the back and sides as far as the pectoral fin, six brown parallel longitudinal bands edged with black; all the fins, except the pectoral, minutely dotted with brown; the spinous dorsal black-edged; the upper half of the soft dorsal and the posterior margin of the caudal blackish. Membrane of the soft dorsal, of the caudal, anal, and ventral fins partially-covered with minute scales.

Madras; Vizagapatam; Sea of Pinang.

15. Pristipoma maculatum.

Anthias maculatus, *Bl.* tab. 326. f. 2; *Bl. Schn.* p. 306.
Lutjanus maculatus, *Lacép.* iv. p. 239.
Caripe, *Russell*, pl. 124.
Pristipoma caripa, *Cuv. & Val.* v. p. 261; *Cant. Catal.* p. 75; *Rüpp. N. W. Fische*, p. 124; *Bleek. l. c.* p. 21.

D. $11 \mid \frac{1}{13-14}$. A. $\frac{3}{7}$. L. lat. 47.

The height of the body is $3\frac{1}{4}$ in the total length, the length of the head $3\frac{1}{2}$; the snout is not longer than the diameter of the eye, and $3\frac{2}{3}$ in the length of the head. The jaws are equal in front; the upper maxillary reaches to the vertical from the anterior margin of the eye. The posterior limb of the præoperculum is conspicuously emarginate, and finely denticulated like the angle. The dorsal fin is deeply notched; the spines are strong; the fourth is the longest, half the length of the head. Caudalis slightly emarginate; the second anal spine, stronger and longer than the third, is not quite so long as the longest of the dorsal. Pectoral elongate, one-fourth of the total length. A black cross-band before the dorsal fin; six large blotches on each side of the back, either forming two longitudinal rows or three cross-bands. The spinous dorsal blackish, with a series of whitish spots along the base; the soft dorsal with two series of brown spots.

From the coast of Coromandel to New Guinea; Red Sea.

a. Half-grown: stuffed. Torres Strait. Voyage of the Rattlesnake.
b. Half-grown. Amboyna. Purchased of Mr. Frank.

16. Pristipoma auritum.

Cuv. & Val. v. p. 263; *Cant. Catal.* p. 76.

B. 7. D. $\frac{12\,(11)}{14}$. A. $\frac{3}{7-8}$.

The length of the opercle little less than one-half of that of the head; it projects backwards above the anterior half of the pectoral. Mouth small. The fourth dorsal spine longest, and equal to the second of the anal. Caudal fin covered almost throughout with minute rough scales; the membrane of the ventrals scaly. The spinous dorsal with numerous brownish spots, forming three to six oblique series; the upper margin black. The soft dorsal with some smaller rounded spots.

Siam; Sea of Pinang.

17. Pristipoma therapon.

Bleeker, Java, i. p. 100, and *Verh. Bat. Gen.* xxiii. *Sciæn.* p. 22.

D. $\frac{12}{14}$. A. $\frac{3}{7}$. L. lat. 40.

The height of the body is $3\frac{1}{2}$ in the total length; the diameter of the eye is one-third of the length of the head, the snout rather shorter. Præoperculum with the posterior limb very slightly emarginate. The fourth spine of the dorsal longest, $1\frac{1}{2}$ in the height of the body; the second of the anal one-sixth of the total length. Uniform; a large brown blotch on the anterior part of the dorsal fin. (*Bl.*)

Sea of Batavia.

18. **Pristipoma terribile.** (Plate XIV.)

D. $12 \mid \frac{1}{12}$. A. $\frac{3}{7}$. L. lat. 46. L. transv. 8/19.

The height of the body is three times in the total length, the length of the head $3\frac{1}{2}$; the snout is rather pointed and longer than the diameter of the eye, which is $3\frac{3}{4}$ in the length of the head. The upper jaw is rather longer than the lower; the maxillary extends nearly to the vertical from the anterior margin of the orbit. The posterior limb of the præoperculum is emarginate and serrated, and the angle produced backwards, rounded, and armed with stronger spinous teeth. Dorsal fin deeply notched; all the spines very strong and long: the fourth of the dorsal is the longest, and more than one-half of the length of the head. Caudalis truncated; the second anal spine exceedingly long, five-sixths of the length of the head; the length of the pectoral is one-fifth of the total. Coloration uniform; the first dorsal with a black edge.

a. Sine patria.

Description of the specimen.—This species is intermediate between *P. hasta* and *P. crocro*. It resembles *Therapon argenteus* in general habit and in the strength of its spines, which are relatively stronger than in any other species of *Pristipoma*. The body is rather compressed and elevated, its greatest depth, below the fourth dorsal spine, being one-third of the total length. The upper profile descends abruptly from its highest point to the nape, where it is slightly concave; from thence to the snout it is straight. The upper surface is moderately broad, the distance between the eyes being less than the width of the orbit. The snout is rather pointed, with the upper jaw slightly overlapping the lower. The teeth form villiform bands without canines or other larger teeth. On the chin there is the usual central groove and some indistinct lateral pores. The præoperculum approaches in form that of *P. hasta*, being conspicuously emarginate, with the angle produced backwards, and armed with much stronger spinous teeth than those of the posterior limb. The scales extend to the margin of the bone, and are smaller than those of the operculum. The operculum has a notch behind, between two feeble and obtuse points. The suprascapula is serrated.

The origin of the *dorsal* fin falls in front of the vertical from the base of the pectoral, and its end before that of the anal; the base of the spinous portion is more than twice as long as that of the soft. The spines are exceedingly strong, on one side broader than on the other:

the first is small; the second one-half the length of the third; the third three-fourths of the fourth, which is the longest, half as high as the body. The following decrease in length to the twelfth; the thirteenth, which must be considered as part of the soft portion, is longer than the two preceding spines, and equal to the tenth. The soft portion has a rounded margin, the second, third and fourth rays being the longest, and equal in height to the sixth spine; they are twice as long as the last, which is the shortest. The spinous portion, as well as the soft, can be received into a scaly sheath. The caudal fin is truncated, and scaly at the base only; one of its longest rays is one-fifth of the total length. The distance between the caudal and anal fins equals the base of the latter; the origin and end of the *anal* fin fall vertically behind the origin and the end of the soft dorsal. The first spine is one-half the length of the third, and is excavated posteriorly. The second is exceedingly long, equal to the height of the body above it, and broader on the left side than on the right. The third is broader on the right side, two-thirds of the length of the former, and shorter than the first ray. The margin of the soft portion of the anal fin is very slightly emarginate. The *pectoral* fin is rather pointed, and of moderate length, one-fifth of the total. The root of the *ventral* fin is situated immediately behind that of the pectoral; the first ray is one-third longer than the strong adjacent spine, and produced into a short filament which extends to the vent.

The *scales* are of moderate size, slightly crenated, quadrangular, rather longer than high; one of the largest covers about one-fifth of the eye. The lateral line is curved, and parallel to the profile of the back.

The specimen is now uniform silvery, with the spinous dorsal black-edged; this part of the fin appears to have been blackish.

A supposition as to the origin of the specimen cannot be given with any certainty, on account of its affinity to neotropical species, as well as to palæotropical; but there is more probability of its being found in a part of the East Indian Seas, or of the Pacific.

	inches.	lines.
Total length	6	11
Height of the body	2	3
Length of the head	2	0
Diameter of the eye	0	6½
Length of the fourth dorsal spine	1	2
——— of the thirteenth dorsal spine	0	7
——— of the third dorsal ray	1	0
——— of the eleventh dorsal ray	0	6
——— of the caudal fin	1	5
——— of the first anal spine	0	7
——— of the second anal spine	1	7
——— of the pectoral	1	5
——— of the ventral	1	6
——— of a large scale	0	2⅓
Height of a large scale	0	2

19. Pristipoma crocro.

Cuv. & Val. v. p. 264.

D. $12 \mid \frac{1}{11}$. A. $\frac{3}{7}$. L. lat. 50–56. L. transv. $\frac{8}{19}$. Vert. 11/15.

The height of the body is four times in the total length, the length of the head $3\frac{3}{4}$. The snout is elongate and rather pointed; the diameter of the eye is $4\frac{1}{2}$ in the length of the head, and $1\frac{1}{2}$ in that of the snout. The upper jaw is rather longer than the lower; the maxillary extends to the vertical from the anterior margin of the orbit. The posterior limb of the præoperculum very slightly emarginate, serrated, the angle not prominent, rounded, and with stronger denticulations. The dorsal fin deeply notched, all the spines strong; the fifth dorsal spine longest, nearly one-half as long as the head. Caudalis truncated; the second anal spine exceedingly strong, nearly two-thirds of the length of the head; pectoral rather short, one-sixth of the total. Coloration uniform; the first dorsal blackish, the pectoral yellowish, the other fins greyish.

Atlantic coasts of Tropical America.

a. Fine specimen. S. Domingo. From Mr. Cuming's Collection.
b. 14″ long: skin. Jamaica. From Dr. Parnell's Collection.
c. Adult: skin: Jamaica. From Dr. Parnell's Collection.
d. Adult.
e. Half-grown.
f. Half-grown: skeleton. Old Collection.
g. Fine specimen. From the Collection of the Zoological Society.—It agrees with the other specimens in all the characters, except in having the dorsal spines, and especially the anal spine, shorter.

Skeleton.—The most superficial comparison of the skeleton of this fish with that of a species of *Therapon* (*e. g. Th. servus*) shows the close affinity of those genera, and the error of Cuvier, who united *Pristipoma*, &c., with the *Sciænidæ*. The upper surface of the skull is nearly even between the orbits, there being two pairs of foramina only, one close together in the middle of the frontal bones, the other more distant from each other, near the anterior extremity of those bones: these foramina lead into narrow muciferous channels in the interior of the bone. The occipital crest is raised above the level of the skull, and moderately elevated; it extends as far as the occipital. On each side of this crest there is another, much lower, running to the point where the suprascapular bone is suspended. The turbinal bones are elongate, concave, forming a half-channel. The intermaxillary is stout and rather short, the upper posterior process being more than one-half of the length of the bone; the anterior portion of each process is broad, the posterior styliform; its posterior margin is S-shaped, without a prominent process. The maxillary is rather narrow, with the posterior margin deeply notched. The lower part of the mandibulary is transformed into a wide muciferous channel, with four grooves, separated from one another by narrow transverse ridges. The infraorbital ring is very narrow, except the præorbital: there is no interior plate to support the eyeball from beneath. The præorbital is triangular, with the lower side curved, and has three or four cavities or wide openings of its muciferous channel. The operculum is very irregularly shaped, and posteriorly armed with two points of nearly equal size, separated from each other by a deep notch; the lower is more acute: there is no ridge on the interior side of the bone. Sub- and interoperculum without any denticulation. The præoperculum is very strongly built and armed; there are three strong but short spinous teeth at the angle, and fifteen smaller ones along the posterior margin; the upper of these teeth are directed upwards; the lower margin is slightly convex and entire. It has four wide openings of the muciferous channel; two larger ones on the lower limb, and two smaller ones above the angle. The suprascapula is strongly, the coracoid bone not serrated.

The vomer is anteriorly broad, rounded, along its middle slightly concave, without any teeth. The teeth in the jaws are placed in broad villiform bands, the lateral ones being scarcely larger than the remainder. The pharyngeal teeth are short, cardiform.

There are eleven abdominal and fifteen caudal vertebræ; the length of the former portion of the column being to that of the caudal as 1:1·5. There are several spurious interneural spines (interneurals without corresponding dorsal spine) in front of the dorsal fin, and each of these interneurals terminates above in a small hook, directed forwards, as is the case in many other fishes. The first interhæmal is very strong, with deep longitudinal grooves; its length equals that of the first eight vertebræ.

20. **Pristipoma coro.**

Seba, iii. 27. 14.
Coro-coro, *Margr.* p. 177.
Sciæna coro, *Bl.* pl. 307. f. 2; *Bl. Schn.* p. 81.
Pristipoma coro, *Cuv. & Val.* v. p. 266; *Cuv. Règne Anim. Ill. Poiss.* pl. 30. f. 2.

D. $11 \left| \frac{1}{13} \right.$. A. $\frac{3}{7}$. L. lat. 50. L. transv. $\frac{6}{12}$.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $3\frac{2}{3}$; the diameter of the eye is one-fourth of the latter; the snout is rather longer, with the lower jaw longest, and with the cleft of the mouth moderate, the upper maxillary reaching somewhat beyond the vertical from the anterior margin of the eye. The posterior limb of the præoperculum obliquely descending backwards, with pointed, distant, spinous teeth; two strong spinous teeth at the angle. Dorsalis deeply notched, with rather strong and long spines; the fourth longest, rather more than one-half the length of the head. Caudalis truncated; the second anal spine exceedingly strong, and even longer than the fourth of the dorsal. Body with about eight brownish cross-bands.

Atlantic coasts of Tropical America.

a, *b*. Adult. S. Domingo. Purchased of Mr. Cuming.

21. Pristipoma catharinæ.

Cuv. & Val. v. p. 269; *Less. Voy. Coq. Zool.* ii. p. 201.

D. $11 \mid \frac{1}{14}$. A. $\frac{3}{10}$.

The height of the body is one-third of the total length. The mouth is small. Præoperculum with rather stronger denticulations at the angle. The dorsal fin notched, with strong and long spines, the twelfth being longer than the two preceding ones. Caudalis emarginate; the second anal spine strong, longer than the third, which equals in length the first ray. Ventral fins longer than pectorals, with a long spine. Coloration uniform; the fins brown, except the pectorals. (*Cuv.*)

Coast of Brazil.

22. Pristipoma rogerii.

Cuv. & Val. v. p. 254.

B. 7. D. $\frac{12}{15}$. A. $\frac{3}{10}$. Cæc. pylor. 5.

The præoperculum with the posterior margin vertical, and with the angle rounded; the fourth and fifth dorsal spines longest, one-third of the greatest depth of the body. The anal spines very strong; the third rather longer than the second, and nearly one-third the depth of the body. Uniform silvery; along the base of the spinous dorsal brown and white spots; on the soft portion brown spots only. (*Cuv.*)

Senegal.

A rather doubtful species, and perhaps identical with the following.

23. Pristipoma bennettii.

Pristipoma bennettii, *Lowe, Trans. Zool. Soc.* ii. p. 176; *Valenc. in Barker-Webb, Hist. Nat. Iles Canar. Ichth.* p. 26; *Guichen. Poiss. in Explor. Algér.* p. 44.

Pristipoma ronchus, *Valenc. l. c.* p. 25. pl. 7. f. 2; *Guichen. l. c.*

D. $\frac{12-13}{16}$. A. $\frac{3}{11-12}$. L. lat. 50–55. L. transv. $\frac{8}{15}$. Cæc. pylor. 8.
Vert. 10/16.

The height of the body nearly equals the length of the head, and is $3\frac{2}{3}$ in the total; the diameter of the eye is one-fourth of the latter, and $1\frac{2}{5}$ in the length of the snout. The cleft of the mouth is moderate, the upper maxillary not reaching to the vertical from the front margin of the orbit. Præoperculum with the posterior limb very slightly emarginate, and with rather coarser denticulations at the angle. Dorsalis notched, and with the spines of moderate strength; the fourth is the longest, and $2\frac{1}{3}$ in the length of the head. Caudalis emarginate; the second anal spine stronger, but not longer than the third, and rather shorter than the highest of the dorsal; the length of the pectoral is $4\frac{1}{3}$ in the total. Coloration uniform; sometimes a greenish-black spot above the angle of the operculum.

Coast of Algiers; Canary Islands; St. Vincent's.

a. Fine specimen. St. Vincent's. From Mr. Macgillivray's Collection.
b–d. Young. St. Vincent's. Voyage of H.M.S. Plumper.
e. Fine specimen. Madeira. From the Haslar Collection.
f. Adult. Madeira. Presented by the Rev. R. T. Lowe.
g. Adult. From the Haslar Collection.
h. Adult: skeleton. From the Haslar Collection.

Skeleton.—The system of muciferous channels is rather more developed than in other species of *Pristipoma*: the two pairs of foramina on the frontal bones are wide, and lead into spacious channels; the turbinal bones are elongate, and transformed into half-canals. The occipital crest is elevated, triangular, and does not extend over the frontal bones. Of the two lateral crests, the interior is short, without free processes posteriorly, and the exterior is wide and muciferous, communicating with channels of the suprascapula and the præoperculum.

The maxillary is very irregularly formed, broadest near its base; it is joined by one process to the palatine bone, by a second to the intermaxillary, and by a third to the vomer. The posterior process of the intermaxillary is longer than the descending, toothed branch of the bone; the anterior portion of each process is broad, the posterior styliform; the descending branch is rather narrow, without any prominence. The lower part of the mandibulary is transformed into a wide muciferous channel, with four grooves, separated from one another by delicate transverse ridges. The præorbital is triangular, with the lower side curved, and has four or five wide openings. The remainder of the infraorbital ring is very narrow, muciferous, and without an interior plate to support the eyeball from beneath.

The operculum has two obtuse and flat points posteriorly, with a deep groove between; there is no longitudinal ridge on its inner surface. The præoperculum is very strongly built; its serrature begins near the upper extremity, the teeth becoming gradually coarser at the angle, and disappearing at the lower limb. The posterior teeth are horizontally directed backwards. There are four wide openings, separated from one another by narrow ridges: two larger ones on the lower limb, one on the angle, and one on the posterior limb. The suprascapula is obtusely denticulated, the coracoid entire.

The lower part of the brain-capsule is slightly swollen, and there is an elongate opening before the occipital joint. The anterior portion of the basisphenoid has a narrow sharp ridge above and below. The head of the vomer is broad, rounded, and slightly concave at its lower surface.

The teeth in the jaws form broad villiform bands, with an outer series of stronger ones. The pharyngeal teeth are stout, conical, and placed in elongate triangular patches below, and in rounded ones above.

There are ten abdominal and sixteen caudal vertebræ, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·5. There are three spurious interneural spines in front of the dorsal fin, each terminating in a small hook, directed forwards. The first interhæmal is very strong, with two divergent anterior ridges, leaving a deep groove between them; it is attached to the eleventh vertebra, and its length equals that of the first seven vertebræ.

24. Pristipoma conceptionis.

Cuv. & Val. v. p. 268, ix. p. 486; *Less. Voy. Coq. Zool.* ii. p. 200; *Gay, Hist. Chil. Zool.* ii. p. 195, *Atl. Ictiol.* lam. 4. f. 2.

D. $\frac{13}{14}$. A. $\frac{3}{13}$. L. lat. 60.

The length of the head is rather less than the height of the body, which is one-fourth of the total. Præoperculum slightly serrated; dorsal and anal fins low; dorsal notched; the spines feeble. Coloration uniform.

Coast of Chili.

25. Pristipoma stridens.

Sciæna stridens, *Forsk.* p. 50.
Pristipoma simmena, *Cuv. & Val.* v. p. 260.
—— stridens, *Rüpp. N. W. Fische*, p. 122. taf. 31. f. 1.

D. 11 $\left|\frac{1}{13\text{–}15}\right.$. A. $\frac{3}{7\text{–}8}$. L. lat. 62. Cæc. pylor. (5) 6.

The height of the body is nearly equal to the length of the head, and somewhat less than one-fourth of the total. The snout is of moderate extent, longer than the diameter of the eye, which is one-fourth of the length of the head. The upper jaw is rather longer than the lower; the maxillary extends nearly to the vertical from the anterior margin of the orbit. The posterior limb of the præoperculum very slightly emarginate, serrated; the angle not prominent, rounded, and with rather stronger denticulations. The dorsal fin deeply notched; the spines slender, but scarcely flexible; the fifth dorsal spine longest, one-half the length of the head. Caudalis emarginate; the second anal spine not strong, and shorter than the third. On each side two to six brownish-black longitudinal bands; if two, one from the eye to the root of the caudal, the other above the lateral line.

Red Sea.

a. Adult. Red Sea.

26. Pristipoma lineatum.

? Pristipoma rubrum, *Cuv. & Val.* v. p. 283.
Pristipoma lineatum, *Cuv. & Val.* v. p. 287.

D. $\frac{12}{14}$. A. $\frac{3}{10}$. L. lat. 56. L. transv. $\frac{8}{16}$. Cæc. pylor, 5.
Vert. 11/15.

The height of the body is $3\frac{1}{4}$ in the total length, the length of the head $3\frac{1}{3}$. The profile of the nape is convex, abruptly descending. The snout is high, and $1\frac{1}{4}$ the width of the eye, the diameter of which is $4\frac{1}{3}$ in the length of the head. The cleft of the mouth is moderate, the upper maxillary reaching exactly to the vertical from the anterior margin of the orbit. The posterior margin of the præoperculum is slightly oblique in a backward direction, and finely denticulated. The dorsal fin scarcely notched; the spines moderate; the fourth longest, and rather shorter than one-half the length of the head. Caudalis emarginate; the second anal spine is stronger than the third, but not longer, and scarcely one-half the length of the fourth dorsal spine. The pectoral fins rather longer than the ventrals. Indistinct oblique streaks above the lateral line; a dark band on the upper half of the operculum; a whitish band along the base of the dorsal fin; the soft portion with or without brownish spots.

Coast of Brazil.

a. Fine specimen. Rio Janeiro. Presented by A. Fry, Esq.

27. **Pristipoma fasciatum.**

Cuv. & Val. v. p. 285, *cop. by Dekay, New York Fauna, Fishes,* p. 87.

D. $\frac{12}{16}$. A. $\frac{3}{13}$. L. lat. 75. Cæc. pylor. 6.

The height of the body is nearly equal to the length of the head, and $3\frac{1}{2}$ in the total. The snout is compressed, produced, with the jaws nearly equal, and with the cleft of the mouth rather small. The diameter of the eye is one-fifth of the length of the head, and less than one-half the extent of the snout. The dorsal fin is nearly even; all the spines rather slender. Caudalis emarginate; the third anal spine somewhat thinner and longer than the second. The sides of the body clouded with darker, in the form of more or less regular cross-bars; a dark streak on the upper half of the operculum, extending on the sides. The dorsal fin with two, posteriorly with three longitudinal series of rounded brown spots.

Coast of the Southern States of North America.

a. Fine specimen. New Orleans. Purchased of Mr. Cuming.

Cuvier mentions his specimens as coming from New York; but it is not confirmed by any of the American naturalists; and I think this to be a more southern species. *Hæmulon fulvomaculatum* of Holbrook appears to be closely allied, but specifically different.

28. **Pristipoma fulvomaculatum.**

Labrus fulvomaculatus, *Mitch. Trans. Lit. & Phil. Soc. New York,* i. p. 406.

Hæmulon fulvomaculatum, *Dekay, New York Fauna, Fishes,* p. 84. pl. 7. f. 21; *Holbr. Ichthyol. S. Carol.* p. 156. pl. 22. f. 2.

D. $\frac{11}{15}$. A. $\frac{3}{12}$. Cæc. pylor. 6.

The height of the body is $3\frac{1}{3}$ in the total length, the length of the head $3\frac{1}{2}$. The upper maxillary does not extend to the vertical from the front margin of the orbit. Præoperculum with the posterior limb very slightly emarginate. Spines of the fins slender; the third of the dorsal fin longest. Caudalis emarginate. Sides of the head and body and the vertical fins with numerous yellow spots; those above the lateral line arranged in irregular oblique series, those below it in horizontal rows. (*Holbr.*)

Coast from Georgia to Virginia.

29. **Pristipoma viridense.**

Cuv. & Val. v. p. 287; *Barker-Webb & Berthelot, Hist. Nat. Iles Canar. Ichthyol.* p. 26.

D. $\frac{13}{15}$. A. $\frac{3}{7}$. L. lat. 80. L. transv. 12/28. Vert. 11/15.

The height of the body is nearly equal to the length of the head, and $3\frac{3}{4}$ in the total; the diameter of the eye is $3\frac{2}{3}$ in the length of the head. Dorsal fin continuous, with the spines of moderate strength; the second anal spine strong, scarcely longer than the third. Caudalis truncated. Coloration uniform brown; dorsal fin with a more or less distinct black margin.

North-west Coast of Africa; Caribbean Sea.

a. Fine specimen. Madeira. Presented by the Rev. R. T. Lowe.
b. Fine specimen. St. Vincent's. Presented by the Lords of the Admiralty.
c. Large specimen: not good state. From the Haslar Collection.

30. **Pristipoma suillum.**

Cuv. & Val. ix. p. 482.

D. $\frac{12}{15}$. A. $\frac{3}{9}$. L. lat. 55.

The height of the body is nearly four times in the total length, the length of the head $3\frac{3}{5}$; the diameter of the eye is one-sixth of the latter, and much shorter than the long and pointed snout; the eye occupies the middle of the length of the head. The præoperculum with a deep sinuosity above the angle, and finely serrated. Dorsal and anal spines rather feeble; caudalis forked; pectoral one-fifth of the total length. Body with streaks formed by greenish spots, oblique above the lateral line, straight beneath; dorsalis with a series of large greenish spots. (*Val.*)

Cape Verde.

31. **Pristipoma peroteti.**

Pristipoma perotaei, *Cuv. & Val.* v. p. 254.

D. $\frac{11}{17}$. A. $\frac{3}{10}$. L. lat. 55. L. transv. 26.

Coloration uniform. (*Cuv.*)

Senegal.

32. Pristipoma octolineatum.

Cuv. & Val. ix. p. 487; *Guichen. Poiss. in Explor. Algér.* p. 44. pl. 2.

D. $\frac{13}{14}$. A. $\frac{3}{7}$.

The height of the body equals the length of the head, and is one-fourth of the total; the diameter of the eye is rather less than one-third of the length of the head. Præoperculum with strong denticulations. Dorsal fin even, caudal scarcely emarginate. On each side four blue longitudinal streaks.

Cape Verde; Coast of Algiers.

33. Pristipoma cantharinum.

Jenyns, Zool. Beagle, Fishes, p. 49. pl. 10.

D. $\frac{12}{15-16}$. A. $\frac{3}{12}$. L. lat. 70.

The height of the body is $3\frac{3}{4}$ in the total length, the length of the head four times; the diameter of the eye is one-fifth of the latter; the snout produced, twice as long, with the jaws equal in front. The upper maxillary does not reach to the vertical from the anterior margin of the orbit. Præoperculum rectangular, with the angle slightly rounded, and the ascending limb straight and finely denticulated. The dorsal fin is scarcely notched, the longest (fourth) spine being $2\frac{1}{2}$ in the length of the head. The caudal forked; the second anal spine stoutest, but rather shorter than the third, and scarcely one-half of the length of the longest of the dorsal fin; the pectorals are $5\frac{1}{2}$ in the total length. Uniform bluish grey.

Galapagos Archipelago.

a. Bleached: $7\frac{1}{2}''$ long.

34. Pristipoma japonicum.

Cuv. & Val. v. p. 288; *Faun. Japon. Poiss.* p. 60. pl. 26. f. 2; *Richards. Ichth. China,* p. 228.

D. $\frac{14-15}{16}$. A. $\frac{3}{7}$. L. lat. 89. Cæc. pylor. 8. Vert. 11/16.

The height of the body is $3\frac{4}{5}$ in the total length, the length of the head 4 or $4\frac{1}{3}$. The snout is short, scarcely longer than the diameter of the eye, with the lower jaw longest; the upper maxillary reaches to the front margin of the orbit. Præoperculum finely serrated throughout, with the posterior limb slightly emarginate, and the angle rounded. Dorsalis not notched; the spines of moderate strength. Caudalis slightly emarginate; the anal spines nearly equal. Coloration uniform.

Chinese and Japanese Seas.

a. Fine specimen. China.
b. Adult: stuffed. China Sea. Presented by J. R. Reeves, Esq.
c. Adult: skeleton. China Sea. Presented by J. R. Reeves, Esq.

Pseudobranchiæ well developed. Air-bladder large, simple.

Skeleton.—In this species the system of muciferous channels is still less developed than in *Pristipoma crocro*. The occipital crest is very elevated, and extends to the anterior extremity of the frontal bones; the lateral crests, between the orbit and suprascapula, are relatively as high. At the anterior end of each frontal bone there is a wide oval opening continued into the channel-shaped turbinal bone. The bones of the jaws are rather feeble: the length of the posterior processes of the intermaxillaries is about one-half of that of the entire bone; a projecting semicircular process at the posterior margin. The maxillary bone is concave posteriorly, and has the lower posterior angle produced. The mandibulary bone has four or five grooves beneath; they are shallow, very small in front, and separated from one another by broad bony interspaces: the anterior part of the vomer is angular and slightly swollen, as in fishes with a toothed vomer. The præorbital is broad, triangular, with some small irregular cavities; the remainder of the infraorbital arch is very narrow, without an interior plate for supporting the eyeball from beneath. The operculum has two very obtuse points, distant and separated from each other by a deep and wide notch; the sub- and interoperculum are not denticulated, and have the lower margins slightly rounded; the limbs of the præoperculum have a vertical direction towards each other, but the angle at which they meet is rounded. The posterior limb is deeply serrated, the inferior very indistinctly; the teeth above the angle are the strongest and spinous. The muciferous channel of the præoperculum has four narrow openings.

There are eleven abdominal and sixteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·5. The neural spines are slightly inclined backwards; the hæmals of the first four caudal vertebræ are lengthened, and broad at their lower extremity, to receive the interhæmals. The first interhæmal is strong, and as long as the first seven vertebræ together.

The *dentition* is composed of villiform bands only, the pharyngeal teeth being rather stronger than those of the jaws.

5. CONODON.

Conodon, *Cuv. & Val.* v. p. 156.

Body oblong; muzzle with the jaws nearly equal in front. Two dorsals, united by a low membrane; the first with eleven strong spines; three strong anal spines. In each of the jaws an external series of very stout, short, conical teeth. Præoperculum denticulated. Scales moderate. Pseudobranchiæ? Air-bladder with two very short horns in front.

Caribbean Sea.

1. Conodon plumieri.

Sciæna plumieri, *Bloch*, vi. p. 66. taf. 306.
Perca plumieri, *Bl. Schn.* p. 85; *Cuv. & Val.* ii. p. 51.

Centropomus plumieri, *Lacép.* iv. p. 268.
Chilodipterus chrysopterus, *Lacép.* iii. p. 542. pl. 33*. f. 1.
Conodon antillanus, *Cuv. & Val.* v. p. 156.

$$\text{D. } 11\,\Big|\,\frac{1}{13}.\quad \text{A. } \frac{3}{7}.\quad \text{L. lat. } 54.\quad \text{L. transv. } \frac{6}{13}.$$

The second anal spine one-half of the length of the head. The upper maxillary reaches to the anterior margin of the eye. Præoperculum with denticulations posteriorly and inferiorly, equal in size, and with two spinous teeth at the angle. Caudalis truncated. Body with eight cross-bands.

Caribbean Sea.

a. Adult: skin. Jamaica. From Dr. Parnell's Collection.
b. Half-grown: skin. Jamaica. From Dr. Parnell's Collection.
c. Adult: stuffed: not good state.
d. Adult: stuffed. Old Collection.
e. Adult: skin: not good state.

The lighter (yellowish) longitudinal bands disappear in the preserved fish.

6. HÆMULON†.

Diabasis, *Desm.*, *Benn.*
Hæmulon, *Cuv. Règne Anim.*; *Cuv. & Val.* v. p. 223.

Form of the body oblong, compressed. Eye moderate. Cleft of the mouth horizontal, generally wide, with the jaws equal. A central groove below the chin. One dorsal, with twelve or thirteen spines, the anal with three; the soft portions of the vertical fins scaly to their margins. Villiform teeth in both the jaws, without canines; none on the palate. Branchiostegals seven. Præoperculum serrated; operculum with very indistinct points. Scales moderate, ctenoid. Pseudobranchiæ. Air-bladder simple; pyloric appendages in small number.

Atlantic coasts of Tropical America.

1. Hæmulon formosum.

Catesby, ii. p. 6. pl. 6. f. 1; *Duham. Pêches*, ii. p. 62. pl. 11. f. 2.
Perca formosa, *Linn. Syst. Nat.* i. p. 488.
Labrus plumieri, *Lacép.* iii. p. 480. pl. 2. f. 2.
Hæmulon formosum, *Cuv. & Val.* v. p. 230; *Casteln. Anim. nouv. ou rares Amér. du Sud, Poiss.* p. 10.

$$\text{D. } \frac{12}{16}.\quad \text{A. } \frac{3}{9}.\quad \text{L. lat. } 50.\quad \text{L. transv. } \frac{4\text{–}5}{18}.$$

The height of the body equals the length of the head, and is $3\frac{1}{3}$ in the total; the diameter of the eye is four times in the length of the head and $1\frac{2}{3}$ in that of the snout; the snout is elongate, compressed; the cleft of the mouth wide; the upper maxillary reaches to below

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[*] Cuvier erroneously quotes pl. 23.

[†] 1. Hæmulon arcuatum, *Cuv. & Val.* ix. p. 481; *Holbr. Ichth. S. Carol.* pl. 17. f. 2.—S. Carolina.
2. Diabasis obliquatus, *Benn. Zool. Journ.* v. p. 90.—Jamaica.

the middle of the eye. The eleventh and twelfth dorsal spines are nearly equal in length. Caudalis forked. The side of the head with eleven or twelve bluish, waving longitudinal streaks, edged with brownish, and not extending on the trunk.

Atlantic coasts of Tropical America.

a. Half-grown. From the Collection of the Zoological Society.
b, c. Fine specimens. Pernambuco. Presented by J. P. Smith, Esq.
d, e. Adult: skins. Jamaica. From Dr. Parnell's Collection.
f, g. Adult: stuffed.

2. **Hæmulon elegans.**

Anthias formosus, *Bl.* taf. 323; *Bl. Schn.* p. 305.
Hæmulon elegans, *Cuv. & Val.* v. p. 227; *Cuv. Règne Anim. Ill. Poiss.* pl. 30. f. 1.

D. $\frac{12}{16}$. A. $\frac{3}{9}$. L. lat. 50. L. transv. 8/16.

The height of the body equals the length of the head, and is $3\frac{1}{3}$ in the total; the diameter of the eye is $1\frac{1}{2}$ in the length of the snout and $3\frac{1}{2}$ in that of the head. The snout is compressed, elongate; the cleft of the mouth wide; the upper maxillary reaches to below the middle of the eye. The eleventh and twelfth dorsal spines are nearly equal in length; caudalis forked. Sides of the head and of the body with seven or eight waving, light-blue longitudinal bands, edged with brownish.

Caribbean Sea.

a. Adult.
b. Half-grown: bleached. Old Collection.
c–e. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.
f. Young.
g, h. Half-grown. From the Haslar Collection.
i. Adult. From the Haslar Collection.
k–n. Adult: stuffed.
o. Adult: stuffed. Old Collection.

3. **Hæmulon microphthalmum.** (Plate XVII.)

D. $\frac{12}{16}$. A. $\frac{3}{8}$. L. lat. 55.

The height of the body equals the length of the head, and is $3\frac{2}{5}$ in the total. The eye is small, its diameter being one-sixth of the length of the head, and contained $2\frac{1}{2}$ in the length of the snout. The cleft of the mouth is rather wide, but the upper maxillary does not reach to the vertical from the anterior margin of the eye. Præoperculum with the posterior limb very slightly emarginate, finely and equally serrated. Dorsal fin not deeply notched, with the spines of moderate strength; the fourth is the longest, and $2\frac{1}{3}$ in the length of the head; caudal forked. The second anal spine very strong, longer than the third, two-thirds of the fourth dorsal spine. Vertical fins covered with very thin scales and transparent. Coloration uniform olive (in a dried state).

Coast of America.

a. Adult: stuffed. America.

Description of the specimen.—This species much resembles *H. elegans, formosum, canna*, &c., but may be readily distinguished by its small eye, uniform coloration, and by the transparent scales, which cover the vertical fins. The length of the head and the height of the body are nearly equal, and $3\frac{2}{5}$ in the total length. The crown is very convex and elevated, much broader than the diameter of the eye, and covered with scales to the nostrils. The eye is nearer the posterior margin of the præoperculum than the end of the muzzle, and relatively smaller than in other species, its diameter being one-sixth only of the length of the head. The præoperculum is finely and equally serrated at both its limbs; the posterior limb is very slightly emarginate, the angle and the inferior limb are rounded. The scales reach to the margin. The suprascapula is serrated.

The base of the spinous portion of the *dorsal* fin is longer than that of the soft. The spines are of moderate strength, on one side broad, on the other with a longitudinal ridge: the first is one-half as high as the second, the second is rather more than one-half of the third; the fourth is a little longer than the third; the following spines gradually decrease in height to the eleventh and twelfth, which are equal. The soft dorsal has the superior margin slightly curved, the middle rays being longest, and about equal to the ninth dorsal spine: this part of the fin is covered with transparent scales nearly to its margin. The distance between the dorsal and caudal fins is equal to the width between the last ten dorsal rays. The *caudal* fin is moderately forked, the lobes being $4\frac{1}{2}$ in the total length: transparent scales cover two-thirds of the fin. The distance between the caudal and anal fins equals the width between the last thirteen dorsal rays. The origin of the *anal* fin falls below the fourth dorsal ray, its end below the twelfth. The first spine is small; the second extremely thick and striated, equal in length to the eighth of the dorsal; the third is shorter and less strong, on the right side flat, on the left with a longitudinal ridge. The first ray is equal to, or rather shorter than, the second spine, and covered with transparent scales, like the whole fin. The *pectoral* is pointed; but the extremity being broken off, I am not able to state the relative length of the fin. The length of the *ventral* is $6\frac{2}{3}$ in the total; its base falls immediately behind that of the pectoral; the spine is moderately strong, and two-thirds of the length of the fin.

The *scales* covering the head are much smaller than those of the body, especially those of the nape; they are very finely ciliated. The scales of the lateral line are small, one-third the size of one of the adjacent series.

The *teeth* are in broad villiform bands, with rather stronger ones in the outer series; those which are placed on the side of the lower jaw are the strongest.

The *colour* is now entirely uniform, each scale having a darker margin.

	inches.	lines.
Total length	14	0
Height of the body	4	1
Length of the head	4	0
——— of the diameter of the eye	0	$7\frac{1}{2}$
——— of the fourth dorsal spine	1	$7\frac{1}{2}$
——— of the eleventh dorsal spine	9	0
——— of the seventh dorsal ray	12	0
——— of the second anal spine	1	$1\frac{1}{2}$

4. Hæmulon macrostoma. (Plate XVIII.)

D. $11 \mid \frac{1}{16}$. A. $\frac{3}{8}$. L. lat. 55–58. L. transv. 10/17.

The height of the body equals the length of the head, and is $3\frac{1}{5}$ in the total. The snout is elongate and compressed, and rather more than twice the diameter of the eye, which is $5\frac{1}{3}$ in the length of the head. The cleft of the mouth is very wide, the upper maxillary nearly reaching to the vertical from the anterior margin of the eye. Præoperculum with the posterior limb nearly vertical, and with obtuse denticulations, which become stronger at the angle, but disappear with age. Dorsal fin deeply notched, with strong spines, the fourth being the longest, $2\frac{1}{2}$ in the length of the head, and the last being considerably longer than the eleventh. Caudalis forked; the second anal spine very strong, scarcely longer than the following, and equal in length to the sixth of the dorsal. The length of the pectoral is $4\frac{2}{7}$ in the total. Five blackish (in a dried state) longitudinal bands, one being very distinct from the eye to the caudal fin, the others more or less indistinct and interrupted.

Jamaica.

a–c. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.

Description.—This fish belongs to the group with the cleft of the mouth wide, and with the vertical fins thickly enveloped by scales, and is closely allied to *H. elegans*, *canna*, &c. The body is rather elevated, its greatest depth being below the origin of the dorsal fin, and contained $3\frac{1}{5}$ in the total length. The length of the head is equal to that height. The mouth is nearly horizontal. The maxillary and intermaxillary may be nearly entirely concealed below the præorbital, the greatest width of which is one-half more than that of the orbit; it is covered with scales, like the cheeks and the præoperculum. The space between the eyes is convex, larger than the width of the orbit, and scaly nearly to the nostrils, which are situated immediately before the eyes. The eye is nearer the posterior margin of the operculum than the end of the snout. The suprascapula is scarcely to be distinguished from the scales; it is inconspicuously serrated.

The *dorsal* fin begins above the base of the pectoral and terminates a little behind the anal; the base of the spinous portion is one-half longer than that of the soft; both portions are separated by a deep notch. The spines are strong: the first is two-fifths of the second; the second three-quarters of the third; the fourth is the longest, and $2\frac{1}{2}$ in the length of the head; the fifth equals the third, and the following gradually decrease in height to the eleventh; the twelfth is longer than the preceding, and it belongs apparently to the soft dorsal, being closely attached to the adjacent ray. The soft portion is so thickly enveloped by scales, that it is difficult to distinguish the single rays. The upper margin is slightly rounded, the third, fourth, and fifth of the rays being the longest, and equal in height to the second spine, whilst the last measures not half that height. The *caudal* fin is moderately forked, and thickly covered by minute scales to its margins. The origin of the *anal* fin falls below the third or the fourth dorsal ray: the soft portion is higher than the spinous, entirely enveloped by scales, and has a rather concave margin. The first spine is very small; the second very strong, striated, equal in length to the sixth dorsal spine, or one-third of the length of the head; the third is rather shorter and not so stout as the other; on one side it is flat and striated, on the other longitudinally grooved. The *pectoral* fin is pointed, and contained $4\frac{2}{7}$ in the total length; it extends to the vertical from the vent; there are some scales at its base. The base of the *ventral* falls below that of the pectoral; and being much shorter than that fin, it does not reach to the vent, and is one-sixth of the total length; a series of small scales follows each of the rays, covering their base and the interspaces between them nearly to the end of the fin. The ventral spine slightly exceeds one-half of the length of the adjacent ray.

The *scales* are of moderate size, ctenoid, and arranged in rather irregular series; those of the lateral line are small, and their number is variable, and would not indicate the number of the transverse series of scales. An oblique stripe of very small scales descends upwards and forwards from the suprascapula to the nape.

The *teeth* form in both the jaws broad villiform bands, but the outer series contains large conical teeth, which are as strong in the lower jaw as in the upper. In one of the specimens, one of the upper pharyngeal bones is preserved; it is armed with powerful teeth, which, at the outer part of the bone, are strong and curved, and towards the middle conical and pointed; on the inner portion of the bone the teeth are obtuse and broad, and assume the character of molars.

The *ground-colour* is now greyish; there is a distinct, straight, blackish band from the middle of the eye to the upper half of the tail. Above this band are two or three others, and below it a fourth, much less distinct, and in two of the specimens interrupted. The ventrals are blackish.

	inches.	lines.
Total length..........................	10	6
Height of the body	4	0
Length of the head	4	0
Diameter of the eye	0	9

	inches.	lines.
Length of the fourth dorsal spine	1	7
——— of the eleventh dorsal spine	0	8
——— of the third dorsal ray	1	5
——— of the second anal spine	1	4
——— of the pectoral	2	11

5. Hæmulon chromis

Perca chromis, *Broussonet.*
Hæmulon canna, *Agass. in Spix, Pisc. Bras.* p. 130. pl. 69 (not *C. & V.*).
—— chromis, *Cuv. & Val.* v. p. 242.

D. $\frac{12}{17-18}$. A. $\frac{3}{8}$. L. lat. 43. L. transv. 6/16.

The height of the body is $3\frac{1}{3}$ in the total length, the length of the head $3\frac{2}{5}$; the diameter of the eye is $1\frac{1}{3}$ in the length of the snout, and $3\frac{3}{4}$ in that of the head. The cleft of the mouth is rather wide, the upper maxillary reaching a little beyond the front margin of the eye. The præoperculum is finely and equally denticulated, with the posterior limb slightly emarginate. The dorsal fin deeply notched, with the spines of moderate strength; the fourth is the longest, $2\frac{1}{2}$ in the length of the head. Caudalis forked, and enveloped by scales nearly to its extremities; the second anal spine much stronger, but scarcely longer than the third, $2\frac{4}{5}$ in the length of the head; ventral and pectoral fins covered with scales. Each scale with a darker centre, the spots forming more or less distinct oblique streaks. A blackish-brown spot, concealed by the angle of the præoperculum. Fins brownish.

Atlantic coasts of Tropical America.

a. Adult. Bahia. Purchased of M. Parzudaki.
b. Adult: not good state. Bahia. Purchased of M. Parzudaki.
c. Fine specimen. Cuba. From the Collection of the Zoological Society.
d. Adult: skin. Jamaica. From Dr. Parnell's Collection.
e. Half-grown: skin. Jamaica. From Dr. Parnell's Collection.
f. Half-grown. Gulf of Mexico. From the Haslar Collection.
g. Large specimen: not good state. South America. Presented by Sir R. Schomburgk.
h. Adult: not good state. S. America. Purchased of Mr. Brandt.
i. Adult. Old Collection, as *Perca chromis.*
k. Adult: not good state. Old Collection.

The fish described by Agassiz (*l. c.*) agrees much better with *H. chromis* than with *H. canna*, Cuv. The number of the soft rays of the dorsal fin, the extent of the upper maxillary, and the less distinct oblique streaks, are the characters by which *H. chromis* may be distinguished from *H. canna.*

6. Hæmulon schrankii.

Agass. in Spix, Pisc. Bras. p. 131. tab. 69*a*.

D. $\frac{12}{18}$. A. $\frac{3}{10}$.

The height of the body is nearly equal to the length of the head, and $3\frac{1}{2}$ in the total. The cleft of the mouth is rather wide, the upper maxillary reaching nearly to below the centre of the eye. The dorsal fin notched, with the spines of moderate strength, and with the fourth longest. Caudalis forked, but the basal half only scaly; the pectoral and ventral fins without any scales. Coloration immaculate. (*Ag.*)

Coast of Brazil.

7. **Hæmulon canna.**

Cuv. & Val. v. p. 233; ? *Castelnau, Anim. nouv. ou rares de l'Amér. du Sud, Poiss.* p. 11 (not *Agass.*).

D. $\frac{12}{16}$. A. $\frac{3}{8}$. L. lat. 48. L. transv. 5/13.

The height of the body equals the length of the head, and is $3\frac{2}{5}$ in the total. The snout is elongate and compressed, and nearly twice the width of the eye, the diameter of which is $5\frac{1}{2}$ in the length of the head. The cleft of the mouth is wide, but the upper maxillary does not reach the vertical from the front margin of the eye. Præoperculum with the posterior limb nearly vertical, and with rather stronger denticulations at the angle. Dorsal fin notched, with strong spines, the fourth spine longest, $2\frac{1}{2}$ in the length of the head; the caudal forked. The second anal spine very strong, rather longer than the third, but not quite so long as the fourth spine of the dorsal (in young specimens rather longer). The length of the pectoral is $4\frac{1}{2}$ in the total. Oblique black bands descend from the back along the series of the scales; dorsal, caudal, anal, and ventral fins blackish.

Coasts of Tropical America.

a–d. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.
e. Adult. Guatemala. Purchased of Mr. Frank.
f. Half-grown. Puerto Cabello. Purchased of Mr. Brandt.

8. **Hæmulon album.**

Cuv. & Val. v. p. 241.

D. $\frac{12}{16}$. A. $\frac{3}{8}$. L. lat. 50. L. transv. 7/16.

The height of the body is $3\frac{1}{4}$ in the total length, the length of the head $3\frac{1}{2}$; the diameter of the eye is one-sixth of the latter, and $2\frac{2}{3}$ in the length of the snout; the cleft of the mouth is wide, but the upper maxillary does not reach to the vertical from the front margin of the orbit. Præoperculum finely and equally serrated, with the posterior limb nearly vertical. The dorsal fin scarcely notched; spines moderately strong, the fourth longest, $2\frac{1}{3}$ in the length of the head. Caudalis forked. The second and third anal spines nearly equal in length and strength, rather longer than one-half of the fourth dorsal spine. Coloration uniform (in a dried state); no black spot behind the angle of præoperculum.

Caribbean Sea.

a. Seventeen inches long: skin. Jamaica. From Dr. Parnell's Collection.

9. Hæmulon xanthopterum.

Hæmulon bonariense, *Cuv. & Val.* v. p. 234.
—— xanthopterum, *Cuv. & Val.* v. p. 234.
—— heterodon, *Cuv. & Val.* v. p. 235. pl. 121.

D. $11 \big| \frac{1}{14-15}$. A. $\frac{3}{8}$. L. lat. 50. Vert. 11/15.

The height of the body is 3 or $3\frac{1}{3}$ in the total length, the length of the head $3\frac{1}{2}$ or $3\frac{2}{3}$. The snout rather pointed, of moderate length, rather longer than the diameter of the eye, which is $3\frac{1}{2}$ in the length of the head. The upper maxillary does not fully extend to the vertical from the centre of the orbit. The posterior limb of the præoperculum is slightly emarginate and minutely denticulated; the angle with rather stronger spinous teeth. The dorsal fin is notched; the spines are moderately strong; the fourth the longest, exactly one-half the length of the head. The soft dorsal, the caudal, and anal fins are thickly enveloped by scales. Caudalis forked; the second anal spine is stronger and longer than the third, and rather longer than the longest of the dorsal. The pectoral fins are turned upwards. *The lateral scales between the pectoral fin and the lateral line are conspicuously much larger than the remainder.* Coloration uniform, with oblique bands beneath the lateral line; a deep-black spot is concealed by the angle of the præoperculum.

Atlantic coasts of Tropical America.

a, b. Adult. West Indies.
c. Adult: skeleton. West Indies.
d. Fine specimen. From the Haslar Collection.
e–l. Adult: stuffed. West Indies. Purchased of Mr. Scrivener.
m. Adult: stuffed. Martinique.
n–y. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.
z. Half-grown: skin. Trinidad. Presented by J. B. Richardson, Esq.
α. Half-grown. Puerto Cabello. Purchased of Mr. Brandt.
β. Half-grown. Old Collection, as *Perca chromis*.
γ. Half-grown: stuffed. From Mr. Yarrell's Collection.

Peritoneum black.

Skeleton.—The system of muciferous channels is more developed than in *Pristipoma*, but much less than in the true *Sciænidæ*. There are four very distinct openings on the upper part of the skull, between the eyes; the posterior and smaller pair close together; the anterior more distant from each other, and close behind the turbinal bone, which, more strongly developed than usual, forms a solid half-channel. Between these openings there is a deep longitudinal groove, widening between the turbinal bones to receive the processes of the intermaxillaries. The occipital crest is very prominent, the horizontal portion being wider than the vertical, and extending on the frontal bones; the lateral crests are relatively less developed, but very distinct, and the outer one is transformed into a muciferous channel, commencing with an elongate opening above the posterior part of the orbit. The basisphenoid is distinguished by a very deep longitudinal groove, arising from the condyloid process of the basioccipital. The intermaxillaries are furnished with very elongate posterior processes, much longer than the bone itself. Cuvier might have placed this species in his family of *Mænides* with greater propriety than several species of *Cæsio*. The maxillary bone, as in most of the species of *Hæmulon* and *Pristipoma*, is broadest near its base, where it is hidden below the large præorbital, the free part being narrow, and nearly of equal width to the posterior extremity. The anterior part of the vomer is slightly swollen and rounded. The mandibulary has four wide cavities below, separated from one another by delicate transverse bones. The operculum has no prominent point, and is irregularly quadrangular, the posterior side being slightly emarginate. The præoperculum has the strongest denticulations at the angle, the posterior margin slightly concave and the inferior convex; its muciferous channel has four wide openings with thin bones between, as in the mandibular channel. The præorbital is very large, triangular, with the inferior side curved; three or four muciferous cavities of considerable width. Suprascapula with some denticulations.

The exterior row of the maxillary teeth, as well as of the mandibulary, contains several larger conical teeth, and there is also a large tooth at the posterior extremity of the row.

There are eleven abdominal and fifteen caudal *vertebræ*, the length of the former portion of the column being to that of the latter as 1 : 1·44. The first interhæmal is strong, and equals the length of the first eight vertebræ together.

10. **Hæmulon caudimacula.**

Cuv. & Val. v. p. 236.

D. $\frac{12}{16}$. A. $\frac{3}{7}$.

Caudalis forked. Brownish oblique streaks on the back and sides; a black spot on each side of the root of the caudal fin; ventral and anal fins blackish. (*Cuv.*)

Coast of Brazil.

11. **Hæmulon chrysopterum.**

Catesby, Hist. Nat. Carol. ii. p. 2. pl. 2. f. 1.
Perca chrysoptera, *Linn. Syst. Nat.* i. p. 488; *Linn. Gm.* p. 1314.
Lutjanus chrysopterus, *Lacép.* iv. pp. 186, 226.
Hæmulon chrysopteron, *Cuv. & Val.* v. p. 240; *Dekay, New York Zool.* iv. p. 85. pl. 7. f. 22; *Holbr. Ichth. S. Carol.* p. 120. pl. 17. f. 1.

D. $\frac{13-14}{15-14}$. A. $\frac{3}{8}$. L. lat. 53. L. transv. 6/13.

The height of the body is $3\frac{4}{5}$ in the total length, the length of the head $3\frac{1}{2}$; the diameter of the eye is $3\frac{1}{2}$ in the length of the head, and $1\frac{1}{3}$ in that of the snout. The cleft of the mouth is wide, the upper maxillary reaching nearly to the vertical from the centre of the eye. The præoperculum with the posterior limb slightly emarginate, and with rather stronger denticulations at the angle. The dorsal fin notched; spines slender, flexible; the fourth longest, $2\frac{1}{2}$

in the length of the head. Caudal fin deeply forked; the second anal spine stronger, but scarcely longer than the third, and much shorter than the fourth of the dorsal. *Scales of the pectoral region not larger than the others.* Coloration uniform (in spirits), without a black spot behind the angle of the præoperculum.

Atlantic coasts of Tropical America; S. Carolina.

a. Adult. West Indies.
b. Adult: stuffed. West Indies.
c–h. Adult: skins. Jamaica. From Dr. Parnell's Collection.
i. Adult: skin. Trinidad. Presented by J. B. Richardson, Esq.
k. Adult: stuffed: not good state. Bahia.

12. **Hæmulon chrysargyreum.** (Plate XVI. fig. B.)

D. $11 \mid \frac{1}{13}$. A. $\frac{3}{9}$. L. lat. 50. L. transv. 9/12.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head nearly four times. The snout is of moderate length and rather shorter than the diameter of the eye, which is one-third of the length of the head. The cleft of the mouth is moderate, the maxillary scarcely reaching beyond the vertical from the anterior margin of the eye. Præoperculum with the posterior limb nearly vertical and finely serrated, the denticulations becoming rather stronger at the angle. Dorsal fin deeply notched, with slender spines, the fourth being the longest and more than one-half of the length of the head. Caudalis deeply forked. The second anal spine rather slender, nearly equal to the following, and one-third the length of the head. Silvery, with five golden parallel longitudinal bands on each side, and a sixth medial one from the crown to the origin of the dorsal; the spinous dorsal blackish.

Caribbean Sea.

a. Adult: stuffed. West Indies. Purchased of Mr. Scrivener.
b. Fine specimen. Trinidad. Presented by J. B. Richardson, Esq.

Description.—The upper profile descends in a gentle curve from the fourth dorsal spine to the end of the snout. The body is not very elevated, its greatest depth being $3\frac{1}{2}$ in the total length. The head forms nearly one-fourth of the same length, and has the crown rather concave and covered with small scales to the nostrils. The distance between the eyes is less than the width of the orbit. The cleft of the mouth is nearly horizontal, with the jaws equal; the upper maxillary reaches to, or scarcely beyond, the anterior margin of the orbit; it is nearly entirely hidden beneath the præorbital, the greatest width of which is three-quarters of the diameter of the eye; the posterior portion of the præorbital is scaly. The eye is rather large, one-third of the length of the head, and nearer the end of the snout than of the operculum. The posterior limb of the præoperculum is very slightly emarginate, or nearly vertical, and finely serrated; the angle is rounded, and armed with rather coarser denticulations. The operculum has a slight notch posteriorly; the suprascapula is hidden by the scales and minutely serrated.

The *dorsal* fin begins above the base of the pectoral, and terminates above, or a little behind, the end of the anal; the base of the spinous portion is one-half longer than that of the soft; both portions are separated by a deep notch. The spines are slender, but not flexible; the first is two-fifths of the length of the second, the second three-fifths of the third, the third rather shorter than the fifth; the fourth longest, one-half of the height of the body. The following spines gradually decrease in height to the eleventh; the twelfth is longer than the preceding, and it belongs apparently to the soft dorsal, being closely attached to the adjacent ray. The soft dorsal is covered with transparent scales from the base to the upper margin, which is nearly straight and obliquely descending backwards; this portion of the fin is much lower than the spinous. The distance between the dorsal and caudal fins is shorter than the base of the soft dorsal. The *caudalis* is deeply forked, the upper lobe (which is rather longer than the lower) being $4\frac{2}{3}$ in the total length, and three times as long as one of the middle and shortest rays. Series of small scales extend over one-half of the lobes. The distance between the caudal and anal fins equals the length of the base of the soft dorsal. The origin of the *anal* falls below the second dorsal ray, the end a little before the vertical from the end of the dorsal. The first spine is small; the second and third are nearly equal, and rather stronger than the dorsal spines, the eighth of which they equal in length. The soft portion of the fin has the margin slightly emarginate, and is thickly covered with minute scales; it is higher than the soft dorsal, the first ray being nearly one-half of the length of the head. The *pectoral* fin is slightly pointed, scaly at the base only, and nearly one-sixth of the total length. The *ventral* is much shorter; its base falls immediately behind that of the pectoral; the spine is two-thirds the length of the first ray; there is a narrow series of minute scales along the outer side of each ray.

The *scales* are of moderate size, one of the largest covering one-sixth of the eye; they are finely serrated, and rather higher than long.

The *teeth* form villiform bands, with the outer series of the upper jaw containing rather larger ones.

The *colours* are beautifully preserved in the specimen from Trinidad. The ground-colour is silvery, with a greyish-green hue on the back. A narrow golden longitudinal streak descends from the origin of the dorsal to the centre of the crown. There are on each side five golden, parallel, longitudinal bands, not much narrower than the intermediate stripes of the ground-colour: the first from the snout above the eye to the middle of the base of the soft dorsal; the second from the upper margin of the orbit crossing the lateral line to the end of the dorsal; the third from the posterior margin of the orbit along the middle of the body; the fourth from the inferior margin of the orbit across the base of the pectoral to the base of the lower caudal lobe; the fifth from the inferior margin of the præorbital to the end of the anal. The upper part of the iris and the inside of the mouth are red. The dorsal and caudal fins blackish; the spinous portion of the former is of deeper black on the marginal half; the anal and ventral fins citrine; pectoral colourless, with the axil blackish. All these colours are changed into a uniform yellowish in dried specimens.

	inches.	lines.
Total length	5	10
Height of the body	1	8
Length of the head	1	6
Diameter of the eye	0	6
Length of the fourth dorsal spine	0	10
——— of the eleventh dorsal spine	0	4
——— of the third dorsal ray	0	7
——— of the upper caudal lobe	1	3
——— of the second anal spine	0	6
——— of the first anal ray	0	8
——— of the pectoral	1	0
——— of the ventral	0	10
——— of a large scale	0	2
Height of a large scale	0	$2\frac{1}{3}$

13. **Hæmulon quadrilineatum.**

? Capeuna, *Margr.* p. 155 (fig. p. 163).
Grammistes trivittatus, *Bl. Schn.* p. 188.
Serranus capeuna, *Licht. Berl. Abhandl.* 1820, p. 288.
Hæmulon quadrilineatum, *Cuv. & Val.* v. p. 238. pl. 120

D. $\frac{13}{14}$. A. $\frac{3}{8}$.

The height of the body equals the length of the head, and is somewhat less than one-fourth of the total. The upper maxillary reaches to the front margin of the orbit. The dorsal spines not very strong; caudalis forked; the second anal spine stronger and longer than the third. Two brown bands along nearly all the side of the body—one above, the other along the lateral line; a short brown streak between the upper band and the spinous dorsal, another along the side of the head above the orbit; two broad golden longitudinal bands from the eye and muzzle beneath the lateral line; dorsal and caudal fins greyish brown. (*Cuv.*)

S. Domingo.

14. **Hæmulon aurolineatum.**

Cuv. & Val. v. p. 237; *Casteln. Anim. nouv. ou rares Amér. du Sud, Poiss.* p. 11.

D. $\frac{13}{15}$. A. $\frac{3}{8}$. L. lat. 54. L. transv. 7/16.

The height of the body is $3\frac{1}{3}$ in the total length, the length of the head $3\frac{2}{3}$; the diameter of the eye is $1\frac{1}{3}$ in the length of the snout, and $3\frac{1}{2}$ in that of the head. The cleft of the mouth is wide, the upper maxillary reaching to below the centre of the eye. Præoperculum with the posterior limb vertical, and with rather stronger denticulations at the angle. The dorsal fin with a notch; the spines rather slender; the fourth longest, rather less than one-half the length of the head. Caudalis deeply forked; the second anal spine rather longer and stronger than the third, but much shorter than the fourth of the dorsal. On each side two brown longitudinal bands, one from the vertex to the end of the dorsal, the other beneath the lateral line from the eye to the middle of the tail; a large brown spot on each side of the base of the caudal.

Atlantic coasts of Tropical America.

a. Fine specimen. Pernambuco. Presented by J. P. G. Smith, Esq.
b. Adult. From the Haslar Collection.

7. HAPALOGENYS.

Hapalogenys, *Richards. Ann. & Mag. Nat. Hist.* 1844, xiii. p. 463, and *Ichthyol. Sulph.* p. 84.
Pogonias, sp., *Temm. & Schleg. Faun. Japon. Poiss.* p. 59.

Form of the body compressed, elevated. Eye moderate. Cleft of the mouth horizontal. Mandibula inferiorly with several pores, hidden by crowded, barbel-like papillæ. Præoperculum serrated; operculum with short spines. Six branchiostegals. One dorsal, with eleven spines, the anal with three; all the spines very strong. Caudal convex. Scales ctenoid, of moderate size. Air-bladder simple. Pyloric appendages in small number. Pseudobranchiæ. The lower pharyngeal bones separated.

Chinese and Japanese Seas.

1. Hapalogenys nigripinnis.

Pogonias nigripinnis, *Temm. & Schleg. Faun. Japon. Poiss.* p. 59. pl. 25 (not good).
Hapalogenys nitens, *Richards. Ann. & Mag. Nat. Hist.* 1844, xiii. p. 463, and *Ichthyol. Sulph.* p. 84. pl. 43. f. 1, 2.
? Hapalogenys maculatus, *Richards. Ichth. China,* p. 235.

B. 6. D. $\frac{11}{15-16}$. A. $\frac{3}{9-10}$. L. lat. 65. L. transv. 11/25. Cæc. pylor. 4.

The fourth dorsal spine longest, nearly one-half the length of the head; the second anal spine rather more than one-half of the fourth of the dorsal fin. Coloration uniform reddish grey; fins blackish.

Chinese Seas.

a. Adult: stuffed. Purchased of Mr. Frank.
b. Half-grown. China. Presented by J. R. Reeves, Esq.

Sir John Richardson mentions, in his 'Report on the Ichthyology of the Seas of China and Japan,' four specimens in the British Museum Collection—types of four species of *Hapalogenys*:—

1. The typical specimen of *H. analis.*

2. A specimen in spirits (4½" long), representing *H. nitens.* This is, without any doubt, the original of the figure in the 'Voyage of the Sulphur.'

3. A specimen of *H. maculatus.* There is no such specimen in the

Collection. Having established the species from the figure of Reeves, he has probably, by some mistake, referred the second specimen to this species. Not trusting in species established from figures, I consider *H. maculatus* as a very doubtful species—if not merely a young individual of *H. nitens*.

4. This specimen (9″ long) is stated to have been received "from Berlin as *Pogonias melanopterus*, out of Bürger's Collection." In fact it has been purchased with that name, of Mr. Frank, who received it from the Leyden Museum. Doubtless it is one of the specimens on which *P. nigripinnis* of the 'Fauna Japonica' was founded, and is of great value, because it proves that the figure given in that work is very faulty, representing the upper profile of the head much too concave, the dorsal spines too slender, the barbels too long, and the coloration too dark; consequently the figure is of no use for determining the species. But, moreover, that specimen proves the unmistakeable identity of *Pogonias nigripinnis* and of *Hapalogenys nitens*; and I am surprised that Sir J. Richardson did not arrive at the same result, having seen both the specimens. The figure in the 'Ichthyology of the Sulphur' is a perfectly true representation of the species.

2. **Hapalogenys mucronatus.**

Pristipoma mucronatum, *Eydoux & Souleyet, Voy. de la Bonite, Zool.* p. 161. pl. 2. f. 1 (1841).

Hapalogenys analis, *Richards. l. c., & Ichth. Sulph.* p. 85. pl. 43. f. 2.

B. 6. D. $\frac{11}{15}$. A. $\frac{3}{9}$. L. lat. 55. L. transv. 11/23.

The third dorsal spine and the second of the anal exceedingly long and strong, the former three-quarters of the length of the head; the anal spine two-thirds of that of the dorsal. Body with dark cross-bands*; the soft dorsal and the caudal black-edged.

China Seas.

a. Stuffed. China. Presented by J. R. Reeves, Esq.

8. DIAGRAMMA.

Diagramma, *Cuv. Règne Anim.*; *Cuv. & Val.* v. p. 290.

Plectorhynchus, (*Lacép.*) *Cantor, Catal.* p. 77.

Form of the body compressed, oblong, with the upper profile of the head parabolic. Cleft of the mouth small, horizontal. Eye moderate. Præoperculum serrated; suborbitals without any spines. Six or seven branchiostegals. No canine teeth. Four or six pores under the mandibula, but no larger groove. One dorsal, with nine to fourteen spines; three anal spines. Caudal not forked. Scales ctenoid, rather small, in the first species moderate. Swim-bladder simple; pyloric appendages in small number.

From the Red Sea through all the East Indian Seas to the Pacific. One species in the Mediterranean.

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* They are not more visible in the specimen in the British Museum Collection.

1. Diagramma gibbosum.

Diagramma gibbosus, (*Hombr. & Jacq.*) *Guichen. Voy. Pôle Sud, Poiss.* p. 46. pl. 5. f. 2.

D. $\frac{13}{18}$. A. $\frac{3}{8}$.

The height of the body is $2\frac{1}{2}$ in the total length, the length of the head nearly four times. The distance of the caudal fin from the dorsal is longer than the height of the tail beneath the end of the dorsal (according to the figure). Dorsal fin notched, with strong spines; caudalis subtruncated; the second anal spine much longer and stronger than the third; the fourth dorsal spine longest. Uniform greenish. (*Guichen.*)

Samoa (Polynesia?).

2. Diagramma crassispinum.

Rüppell, N. W. Fische, p. 125. taf. 30. f. 4.

D. $\frac{14}{16-17}$. A. $\frac{3}{7}$.

The height of the body is $2\frac{3}{4}$ in the total length, the length of the head $3\frac{3}{4}$; the distance between the dorsal and caudal fins is much longer than the height of the tail below the end of the dorsal (according to the figure). Dorsal fin notched, with strong spines; the fourth dorsal spine longest, $2\frac{1}{5}$ in the height of the body; the second anal spine much longer and stronger than the third. Caudalis truncated. Uniform blackish; fins black. (*Rüpp.*)

Red Sea.

3. Diagramma affine. (Plate XIX. fig. A.)

? Diagramma crassispinum, *Bleek. Verh. Batav. Genootsch.* xxiii. *Sciæn.* p. 26 (not *Rüpp.*).

D. $\frac{14}{16}$. A. $\frac{3}{7}$. L. lat. 45. L. transv. 9/16.

The height of the body is $2\frac{1}{2}$ in the total length, the length of the head $3\frac{2}{5}$; the distance between the dorsal and caudal fins is less than the height of the tail below the end of the dorsal. Dorsal fin notched, with strong spines, the fourth of which is the strongest, $2\frac{1}{3}$ in the height of the body; the second anal spine much longer and stronger than the third. Caudalis slightly convex. Uniform brownish; the dorsal, anal, and ventral fins black.

Coasts of N.W. Australia; East Indian Archipelago.

a. Adult: very bad state. N.W. Australia. Presented by Sir J. Richardson.
b. Adult. From the Haslar Collection.
c. Adult. From the Haslar Collection.
d. Adult: deformed. Moluccas. Purchased of Mr. Frank.
e. Fine specimen. Purchased of Mr. Frank.
f. Half-grown. Amboyna. Purchased of Mr. Frank.
g. Half-grown. Madras. Presented by J. C. Jerdon, Esq.
h. Fine specimen. China. Presented by Capt. Sir E. Belcher.

Description.—This species is closely allied to *D. crassispinum*, Rüpp., from which, however, it must be distinguished, on account of its shorter and higher tail. One might also suppose it to be identical with *Pristipoma nigrum*, of which we find a bad description by Cuvier in the *Hist. Nat. des Poissons*: but our fish, having no central groove beneath the chin, cannot be referred to *Pristipoma*. The form of the body is very compressed and elevated, its greatest depth being $2\frac{1}{2}$ in the total length. The upper profile is nearly straight along the base of the spinous dorsal, but it descends steeply along that of the soft, and still more from the origin of the dorsal to the snout. The lower profile is nearly straight between the snout and the anal fin. The length of the head is $3\frac{2}{5}$ in the total; it is very compressed, the distance between the eyes being one-half only of the width of the orbit. The snout is short, but elevated; the cleft of the mouth horizontal, rather narrow, the upper maxillary extending to the vertical from the anterior margin of the orbit; all the snout scaleless. The nostrils are situated immediately before the eye; they are rather distant from each other, and nearly equal in width. The diameter of the eye is $3\frac{1}{3}$ in the length of the head, and longer than the greatest width of the præorbital. The præoperculum is distinctly serrated, and covered with scales to the margin; its posterior limb is nearly vertical and twice as long as the inferior; the angle is rounded. The operculum has a crescent-shaped notch between two obtuse points. The suprascapula is serrated.

The *dorsalis* begins above the suprascapula and terminates a little behind the anal; the length of the base of the spinous dorsal is nearly twice as long as that of the soft. The spines are strong, and broader on one side than on the other: the first is two-fifths of the length of the second, the second three-fifths of the third; the fourth is the longest, and $2\frac{1}{3}$ in the height of the body; the following decrease in length to the thirteenth, the last being a little longer than the preceding, and about equal to the second. The soft dorsal has a rounded upper margin, the middle rays being the highest, but rather shorter than the fourth dorsal spine. All the fin is scaleless, and moves in a scaly sheath. The distance between the dorsal and caudal fins is nearly one-half the length of the base of the soft dorsal, and less than the height of the tail below the end of that fin. The *caudal* fin is slightly rounded, scaly at the base, and its length $5\frac{3}{4}$ in the total. The distance between the caudal and anal fins equals the length of the base of the latter. The origin of the *anal* fin falls vertically below the fourth dorsal spine, and its end a little before that of the dorsal; the spines are very strong: the first is one-third of the length of the second, the second is $2\frac{1}{2}$ in the height of the body; the third is one-third shorter than the former, and broader on the right side than on the left. The soft portion is shorter than the spinous, and the whole fin moves in a scaly sheath. The *pectoral* is rounded, and shorter than the *ventral*, the length of which is $4\frac{2}{3}$ in the total; it reaches to the vent, and its base is situated posteriorly to that of the pectoral.

The *scales* are of moderate size, one of the largest covering about one-fourth of the eye: they are finely ciliated, and about as high as long. Those above the lateral line are rather smaller than those below it, therefore the number of transverse series of scales below that line is less (45). The curvature of the lateral line follows that of the back.

The *coloration* is uniform brownish, the breast white; all the fins, except the pectorals and the caudal, are black. The caudal and the margin of the soft dorsal and anal are white (in spirits).

	inches.	lines.
Total length	4	3
Height of the body	1	9
——— of the tail below the end of the dorsal	0	6
Distance between dorsal and caudal fins	0	$4\frac{1}{2}$
Length of the head	1	3
Diameter of the eye	0	$4\frac{1}{2}$
Length of the fourth dorsal spine	0	9
——— of the thirteenth dorsal spine	0	$3\frac{1}{2}$
——— of the fifth dorsal ray	0	8
——— of the second anal spine	0	$8\frac{1}{2}$
——— of the pectoral	0	9
——— of the ventral	0	11
——— of a large scale	0	2
Height of a large scale	0	$2\frac{1}{3}$

4. Diagramma griseum.

Cuv. & Val. v. p. 306.

D. $\frac{12}{21}$. A. $\frac{3}{7}$. Vert. 10/16.

The height of the body is one-third of the total length, the length of the head one-fourth. Caudalis truncated; the second anal spine strong. Uniform greyish. (*Cuv.*)

Coast of Malabar.

5. Diagramma pertusum.

Perca pertusa, *Thunberg, Nya Handl. Stockh.* 1793, xiv. p. 198. pl. 7. f. 1 (sec. *Bloch*)

Lutjanus pertusus, *Bl. Schn.* p. 328.

Diagramma thunbergii, *Cuv. & Val.* v. p. 308.

D. $\frac{10}{21}$. A. $\frac{3}{6}$

Uniform brownish (in a dried state).

Japanese Sea.

6. Diagramma mediterraneum.

Guichen. Explor. Algér. Rept. et Poiss. p. 45. pl. 3.

D $\frac{12}{17}$. A. $\frac{3}{9}$

The height of the body is three times in the total length, the length of the head $3\frac{3}{4}$; the diameter of the eye is one-third of the latter. Dorsalis nearly even, caudalis forked. Uniform greyish; fins blackish brown. (*Guich.*)

Coast of Algiers.

7. Diagramma centurio.

Cuv. & Val. v. p. 308.

D. $\frac{10}{26}$. A. $\frac{3}{7}$.

Brownish grey; neck, back, dorsal and caudal fins dotted with brown. (*Cuv.*)

Seychelles.

8. Diagramma shotaf.

Sciæna shotaf, *Forsk.* p. 51.
Diagramma shotaf, *Rüpp. Atl. Fische,* p. 126, and *N. W. Fische,* p. 125; ? *Cuv. & Val.* v. p. 305.

D. $\frac{14}{19-20}$. A. $\frac{3}{7}$.

The height of the body is one-third of the total length, the length of the head one-fourth. The height of the soft dorsal is one-half of the greatest depth of the body. Caudalis truncated; the second anal spine longer and thicker than the third. Grey, with blackish fins, and two light-blue streaks from the eye on the præoperculum.

Red Sea.

9. Diagramma fœtela.

Sciæna fœtela, *Forsk.* p. 51.
Diagramma flavo-maculatum, (*Ehrenb.*) *Cuv. & Val.* v. p. 304; *Rüpp. Atl. Fische,* p. 127.
—— fœtela, *Cuv. & Val.* v. p. 305 (adult); *Rüpp. N. W. Fische,* p. 125.

D. $\frac{12}{23}$. A. $\frac{3}{8}$.

The height of the body is one-third of the total length, the length of the head nearly one-fourth. Along the back two series of rounded yellowish spots; across the opercles several yellowish longitudinal bands, continued on the body, but interrupted, and forming spots on the posterior half; the dorsal fin with a yellowish margin and two series of yellowish spots; caudal and anal fins spotted with yellow. Uniform with age.

Red Sea.

10. Diagramma gaterina.

Sciæna gaterina, *Forsk.* p. 50.
Renard, fol. 3. f. 17.
Holocentrus gaterina, *Lacép.* iv. p. 347.
Diagramma gaterina, *Cuv. & Val.* v. p. 301. pl. 125; *Rüpp. Atl. Fische,* taf. 32. f. 1.

B. 7. D. $\frac{13}{19-20}$. A. $\frac{3}{7}$. L. lat. 80. L. transv. 12/25. Vert. 11/16.

The height of the body is one-third of the total length, the length of the head nearly one-fourth. The third spine of the dorsal fin and the following four or five nearly equal in height. Caudalis truncated; the second anal spine stronger, but not much longer, than the third. Body and vertical fins with numerous blackish-brown spots.

Red Sea.

a. Adult. Red Sea. From the Senckenberg Museum.
b. Adult: stuffed.

The fish mentioned by Sir J. Richardson (*Ichthyol. China*, p. 227) cannot belong to this species, its numbers being—D. $\frac{14}{15}$. A. $\frac{3}{7}$.

11. Diagramma pardalis.

Diagramma pardalis, (*Kuhl & v. Hasselt*) *Cuv. & Val.* v. p. 300.

D. $\frac{12}{18}$. A. $\frac{3}{8}$. L. lat. 80. L. transv. 12/22.

The height of the body is three times in the total length, the length of the head $3\frac{2}{3}$; the diameter of the eye is $4\frac{1}{2}$ in the length of the head, and one-half of that of the snout. The upper maxillary does not extend to the vertical from the front margin of the orbit. Præoperculum with the posterior limb vertical, and the angle rounded, finely and equally serrated. The dorsal fin cannot be entirely concealed in a scaly sheath; it is deeply notched, with the middle part of the soft portion elevated; the spines are moderate, the fourth the longest, and $2\frac{1}{2}$ in the length of the head. Caudalis emarginate; the second and third anal spines nearly equal in length, but the former stronger. Head, body, and vertical fins covered with numerous round brown spots; the spinous dorsal edged with deep black; pectoral and ventral fins blackish, the former dotted with brown.

Javanese Sea.

a. Large specimen (15″).
b. Large specimen: not good state: has been in chloride of zinc. Purchased of Mr. Frank.
c. Half-grown: stuffed: bad state.

12. Diagramma punctatum.

Diagramma punctatum, (*Ehrenb.*) *Cuv. & Val.* v. p. 302; *Faun. Japon. Poiss.* p. 60; *Rüpp. Atl. Fische*, p. 126. taf. 32. f. 2, and *N. W. Fische*, p. 125; *Quoy & Gaim. Voy. Astrol. Poiss.* pl. 12. f. 2. p. 699*; *Cuv. Règne Anim. Ill. Poiss.* pl. 30. f. 3; *Bleeker*, *Verh. Batav. Genootsch.* xxiii. *Sciæn.* p. 25 (not synonymy).
Holocentrus radjabou, *Lacép.* iv. pp. 335, 374.
Diagramma cinerascens, *Cuv. & Val.* v. p. 307 (adult); *Rüpp. Atl.* p. 127.

B. 7. D. $\frac{10}{22-23}$. A. $\frac{3}{7}$. L. lat. 85. Vert. 12/15.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $4\frac{1}{5}$. The width of the eye is scarcely longer than the extent of the snout, and $3\frac{1}{2}$ in the length of the head. The upper maxillary extends to the vertical from the front margin of the orbit. Præoperculum with the posterior limb vertical, and the angle rounded, finely and equally serrated. The dorsal fin moves in a high scaly sheath, and is even or slightly notched; the spines are moderate, the second and third the longest, half the length of the head. Caudalis truncated; the second and third anal spines nearly equally strong, the latter rather longer. Body and vertical fins with numerous brown spots, disappearing with age; the dorsal and anal fins with a black margin. Sometimes light longitudinal streaks at the side of the head.

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* These naturalists give the following numbers: B. 5. D. $\frac{10}{14}$. A. $\frac{3}{7}$, &c. (!)

Red Sea; Trincomalee; Seas of Java and Vanicolo; Sea of China.

a. Adult: stuffed. Red Sea. From the Senckenberg Museum.
b. Adult: skin. Ceylon. Presented by E. F. Kelaart, M.D.
c. Adult. China.
d. Adult. China.
e, f. Half-grown. From the Haslar Collection.
g. Half-grown: stuffed. From the Collection of the Zoological Society.
h. Adult: skeleton. From the Haslar Collection.

The *air-bladder* has been described* as simple, but a closer examination has shown me that there are several slender horns in front and on the sides of the anterior quarter. Their number differs in different individuals from five to eight. They are rather short, and, *reaching between the muscles of the abdominal cavity*, have here the very peculiar purpose of fixing the air-bladder; they decrease in length posteriorly, and are hollow.

Skeleton.—The *maxillary* bone scarcely widens at its posterior extremity, but it has the inferior angle produced; the *intermaxillary* is a little shorter, and has a flat prominence posteriorly, and a deep notch between this prominence and the process; its posterior process is broader and stronger than the bone itself, and of about the same length, but does not extend to the level of the orbit. The *vomer* has anteriorly an angular transverse ridge, as in species with a toothed vomer; its posterior portion is longitudinally grooved. The *mandibula* is elevated, but short, its length slightly exceeding the width of the orbit; the muciferous channel, which is contained in the lower part of the bone, is nearly entirely closed by the bone, there being two or three small openings only, as is the case with nearly all the rest of the system of muciferous channels. The *turbinal* bones are very elongate, tubuliform, with a long slit posteriorly and a small opening in front; there is a wide interspace between these bones to receive the posterior processes of the intermaxillaries. The free margin of the *palatine* bone has nearly a vertical direction; the pterygoid reaches to the mandibulary joint, and terminates in a small prominent knob. The *pre-*, *meso-*, and *epitympanic* form together an oblong plate, with a central impression and a wide opening between the pre- and epitympanic.

The *occipital* crest is very elevated, its horizontal portion being nearly three times as wide as the vertical, and extending to the level of the anterior margin of the orbit. There are, besides, two similar crests on each side from the orbit to the scapulary; they are very developed, the outer being lower and muciferous, and the inner continued into the upper orbital edge, which is likewise elevated. There are two pairs of openings of moderate width at the anterior extremity of the frontal bones, one pair behind the other. The lower portion of the brain capsule is slightly compressed; the *basisphenoid* has two longitudinal ridges, with a groove between.

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* *Rüpp. Atl.* p. 126.

The *praeorbital* is pentagonal, longer than high, and has several irregular openings; the remainder of the infraorbital arch is very narrow.

The *praeoperculum* is distinguished by its form, the posterior limb being more than twice as long as the inferior; the angle is rounded; four oblique openings lead into the interior of the channel. The marginal serrature is very distinct, and coarsest at the angle. The *operculum* is quadrangular, with the superior side emarginate, and with a deep notch posteriorly; the notch is between two points, neither of which projects beyond the margin, and the lower of which is the termination of a slight ridge on the interior surface of the bone. The *sub-* and *interoperculum* do not show any peculiarity. The *suprascapula* has a small irregular opening; the *glossohyal* styliform, broadest anteriorly.

There are twelve abdominal and fifteen caudal *vertebrae*, the length of the former portion of the column being to that of the caudal as 1 : 1·1. The neural spines of the first ten vertebrae are strong, broad, and compressed, corresponding to a similar development of the interneurals of the spinous dorsal. The first interhaemal is moderately strong, and equal to the length from the second vertebra to the eighth; it is attached to the haemals of the twelfth and thirteenth vertebrae.

13. Diagramma cinctum.

Temm. & Schleg. Faun. Japon. Poiss. p. 61. pl. 30. f. 1 (not good); *Richardson, Ichth. China*, p. 228.

B. 7. D. $\frac{14}{15-16}$. A. $\frac{3}{7}$. L. lat. 62.

The height of the body is one third of the total length, the length of the head two sevenths; the diameter of the eye is $1\frac{1}{4}$ in the length of the snout, and $3\frac{2}{3}$ in that of the head. Lips thick, swollen; the upper maxillary does not reach to the vertical from the anterior margin of the eye. Praeoperculum with the posterior limb vertical, and with the angle rounded; it is finely and equally serrated, some of the denticulations being directed upwards. The dorsal fin more or less deeply notched, all the spines strong, compressed; the fourth spine longest, more than one half the length of the head; the second anal spine much stronger and longer than the third, but shorter than the longest of the dorsal. Caudal fin slightly convex. The upper half of the body and the vertical fins with large brown spots, those of the body sometimes smaller. A light-brown band from the origin of the dorsal to the base of the pectoral; a second, curved, from below the middle of the spinous dorsal to the end of the soft dorsal; a light-brown ovate blotch below the anterior half of the soft dorsal.

Chinese and Japanese Seas.

a. Adult. China. Presented by J. R. Reeves, Esq.

b. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
c. Adult. China.
d. Half-grown. China.
e. Adult: skeleton. China.
f. Adult: stuffed. Japan. Purchased of Mr. Frank.
g. Adult: skin. Nepal? Presented by B. H. Hodgson, Esq.

14. Diagramma chætodonoides.

Plectorhynchus chætodonoides, *Lacép.* iii. p. 135, ii. pl. 13. f. 2.
Lutjanus chætodonoides, *Lacép.* iv. pp. 195, 243.
Chætodon plectorhynchus, *Shaw, Zool.* iv. p. 356. pl. 49.
Diagramma plectorhynchus, *Cuv. & Val.* v. p. 294; *Bleek. Verh. Batav. Genootsch.* xxiii. *Sciæn.* p. 24.

B. 7. D. $\frac{12}{19}$. A. $\frac{3}{7-8}$. Cæc. pylor. 12.

The height of the body is $2\frac{1}{2}$ in the total length. The dorsal spines of moderate length and strength, the second of the anal fin rather long and strong. Brownish black, with nine white blotches on each side, each with a blackish centre. The soft dorsal and the anal white, with black spots; the spinous dorsal blackish, with a whitish margin; pectoral and ventral fins black.

Sea of Batavia.

Cuvier considers a fish in the Collection of the Leyden Museum as a variety of this species: it has a whitish ground-colour, the back marbled with blackish; a whitish spot in front of the ventral fins, another behind the pectoral, a third, round, above the anal, and a fourth, square, occupying the tail; the vertical fins black-spotted.

15. Diagramma pica.

Seba, iii. 26. 31.
Diagramma pica, *Cuv. & Val.* v. p. 297.

D. $\frac{12}{21}$. A. $\frac{3}{7}$. L. lat. 85.

The height of the body is $3\frac{1}{2}$ in the total length; the dorsal spines one-fourth of the height of the body. Three large white spots on each side, one across the muzzle, one across the neck, and a third near the end of the spinous dorsal; belly and lower parts of the sides white, notched by the black coloration of the back. Dorsal fin black, above the white spot white; caudal white, with irregular black bands and spots. (*Cuv.*)

Sea of Otaheiti.

16. Diagramma orientale.

Anthias orientalis, *Bloch*, taf. 326. f. 3; *Bl. Schn.* p. 306.
Lutjanus aurantius, *Lacép.* iv. p. 239.
Serranus orientalis, *Cuv. & Val.* ii. p. 318.

Diagramma orientale, *Cuv. & Val.* v. p. 299. pl. 124; *Bleeker. Verh. Bat. Gen.* xxiii. *Sciæn.* p. 23.
—— sibbaldii, *Benn. Proc. Zool. Soc.* 1832, p. 182.

D. $\frac{13}{17-18}$. A. $\frac{3}{8}$. L. lat. 65.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $4\frac{1}{2}$. Dorsal fin notched; spines moderate, the second anal spine stronger and longer than the third. A white spot across the muzzle, another across the neck, a third near the end of the spinous dorsal, a fourth round the tail; belly of white colour, extending on several parts of the side of the body; dorsal fin black, above the white spots white. Caudal white, with a black longitudinal streak, and with blackish margins.

Seas of Ceylon and Bali.

a. Half-grown. Ceylon. From the Collection of the Zoological Society. Type of *Diagramma sibbaldii*.

17. Diagramma pictum.

Seba, iii. 26. 32 (very bad).
Perca picta, *Thunb. Nya Handl.* xiii. p. 141. pl. 5.
Grammistes pictus, *Bl. Schn.* p. 190.
Lutjanus pictus, *Lacép.* v. pp. 687, 688.
Diagramma pictum, *Cuv. & Val.* v. p. 315; *Faun. Japon. Poiss.* p. 62; *Richardson, Ichth. China*, p. 227.
Plectorhynchus balteatus, *Cant. Catal.* p. 78.

D. $\frac{9-10}{23}$. A. $\frac{3}{6}$. L. lat. ca. 95. Cæc. pylor. 5.

The height of the body is $3\frac{1}{3}$ in the total length, the length of the head $4\frac{1}{3}$; the diameter of the eye is $3\frac{2}{3}$ in the latter. The dorsal fin is slightly notched, and has the second spine elevated, $\frac{2}{3}$ or $\frac{3}{4}$ of the greatest depth of the body. Caudalis convex. The second anal spine stronger and a little longer than the third. Belly yellowish; back and sides brown, with four (in varieties with less or more) white longitudinal bands. The first from the muzzle along the median line of the crown, bifurcating on the neck into two bands, one on each side; the lateral part runs to the anterior part of the soft dorsal, sending upwards a vertical portion to the first three dorsal spines. The second band, broader, from the nostril above the eye to the back of the tail, continued on the last rays of the dorsal, as well as on the upper part of the caudal. The third from the lower margin of the orbit to the lower part of the caudal. The fourth, indistinct from the yellowish coloration of the belly, from the snout to behind the anal fin. The spinous dorsal black, between the first three spines white; the soft portion with a broad white longitudinal band, and with the posterior rays white. The caudal with a broad black median band, and with two oblique ones of the same colour on each lobe; the anterior half of the anal black, the remainder white; pectoral colourless, ventral black in the outer half.

Coast of Pondicherry; Seas of Pinang, Java, and Amboyna; Chinese and Japanese Seas.

a. Half-grown. China. Presented by Sir J. Richardson.
b. Half-grown. Japan. Purchased of Mr. Frank.
c. Half-grown. Amboyna. Purchased of Mr. Frank.
d. Half-grown.
e. Young. From the Haslar Collection.
f, g. Half-grown: dried: not good state.

There can be no doubt that the fish described by Dr. Cantor as *Plectorhynchus balteatus* belongs to the typical form of *Diagramma pictum*. He appears to have been misled by his specimens exhibiting twenty-three rays of the dorsal, and the length of the second dorsal spine being contained $\frac{3}{4}$ in the depth of the body, which is really more in accordance with Cuvier's description of *Diagramma balteatum*. But, on the other hand, the coloration is exactly the same as in *D. pictum*, and differing from *D. balteatum*; and Cuvier does not mention anything about the height of the dorsal spines of *D. pictum*. In fact, the height of these spines appears to vary very much; and I fully believe that *D. balteatum* is a variety of *D. pictum*, so that Dr. Cantor's mistake appears to be of no great consequence.

Var. A.

h, i. Adult. Madras. Presented by J. C. Jerdon, Esq.

I consider these two specimens as a variety of *D. pictum*. The form of the body is the same, the second anal spine three-fifths of the height of the body. Six white longitudinal bands on each side: the first as in the typical specimens; the second (additional) narrow and short from the crown of the head, lost on the anterior third of the body; the third like the second in the type; the fourth (additional) from the middle of the eye to the root of the caudal; the fifth and sixth like the third and fourth in the type. On the dorsal the white band of the soft portion is continued on the spinous; the membrane between the first three spines white; on the other fins the black colour predominates; pectorals colourless. These specimens have nine dorsal spines.

Var. B. DIAGRAMMA BALTEATUM.

Diagramma balteatum, (*Kuhl & v. Hass.*) *Cuv. & Val.* v. p. 316.

$$D. \frac{10}{23}. \quad A. \frac{3}{7}.$$

The height of the body is $3\frac{1}{3}$ in the total length, the length of the head $4\frac{1}{5}$. The dorsal fin is slightly notched, and the second spine is $\frac{3}{4}$ as high as the body. Caudalis convex. Belly yellowish; back and sides brown, with a white spot beneath the first three dorsal spines. One white band from above the eye to the upper half of the caudal; the remainder of the caudal black. Dorsal black, with a white longitudinal band along the middle, and with the posterior part white.

Sea of Java.

k, l. Half-grown. China or Borneo? Presented by Sir Edward Belcher.

18. Diagramma pœcilopterum.

Diagramma pœcilopterum, *Cuv. & Val.* v. p. 314; *Faun. Japon. Poiss.* p. 61.

D. $\frac{9}{23}$. A. $\frac{3}{5}$.

White, with six or seven black longitudinal bands, alternately complete and interrupted; dorsal and caudal with round or irregular black spots; anal and ventrals black.

Coast of Pondicherry; Trincomalee; Molucca Sea; Japanese Sea.

19. Diagramma lessonii.

Cuv. & Val. v. p. 313; *Less. Voy. Coq. Zool.* ii. p. 199. pl. 24 (bad); *Bleek. Batav.* p. 463.

B. 6. D. $\frac{12(-13)}{19}$. A. $\frac{3}{7}$ L. lat. 90.

The height of the body is $3\frac{1}{4}$ in the total length, the length of the head $4\frac{1}{4}$; the diameter of the eye is $3\frac{1}{4}$ in the latter. Dorsalis even, the third, fourth and fifth spines longest, $2\frac{1}{2}$ in the length of the head. Caudalis truncated; the second anal spine longer and stronger than the third. Back and sides blackish brown, with five white longitudinal bands (on the head six); belly whitish. All the bands meet those of the other side on the crown and muzzle: the first from the nape to the first dorsal rays; the second from the crown to the middle of the base of the soft dorsal; the third from the upper margin of the orbit to the back of the tail; the fourth from the lower posterior angle of the orbit to the middle of the root of the caudal; the fifth from the lower margin of the orbit to the lower part of the tail; the sixth on the head only, from the snout to the base of the pectoral. The spinous dorsal blackish brown, with a serrated, white, broad longitudinal band, continuing near and along the upper margin of the soft dorsal, but narrower. The soft dorsal yellowish, with a brownish-black narrow edge, besides the white band and large round brown spots; dorsal and anal largely spotted with brown; pectoral not coloured; ventral with the outer half brown.

Waigiou; Amboyna.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.

20. Diagramma blochii.

Anthias diagramma, *Bl.* tab. 320.
Grammistes diagramma, *Bl. Schn.* p. 184.
Sparus diagramma, *Shaw, Zool.* iv. p. 440. pl. 65.
Diagramma blochii, *Cuv. & Val.* v. p. 312.
Plectorhynchus blochii, *Cantor, Catal.* p. 77.

B. 6. D. $\frac{10}{23}$. A. $\frac{3}{7}$.

The second, third and fourth dorsal spines equal or even slightly exceed one-half of the height of the body; the second and third anal spines equal the length of the tenth dorsal spine, and slightly exceed one-third of the height of the body. Yellow: from between the eyes a longitudinal brown band following the back, continuing above the base of the soft dorsal fin ; a second from the muzzle above the orbit, dividing in two portions, which again unite above the middle of the pectoral fin, and continue straight to the posterior part of the soft dorsal ; a third, the broadest, from the eye straight to the root of the caudal ; a fourth, under and parallel to the latter ; a fifth and sixth, of lighter brown, from the muzzle to the posterior part of the abdomen ; a seventh, similar, from the gill-opening to the posterior part of the root of the caudal fin. The margin of the dorsal black ; between the root of the third and fourth dorsal spines a black spot ; from the point of the second to the base of the eighth spine, a broad oblique black band, continuing straight to the middle of the soft dorsal, where it unites with the first band of the body, and thus continues to the posterior part of the fin ; caudal orange, with scattered irregular black spots ; anal and ventral greyish, posterior part black ; pectorals orange, with a black band across the root, the centre, and the point. (*Cant.*)

Seas of Ceylon and Pinang.

? *a*. Adult : skin : not good state. East Indies.

21. Diagramma albovittatum.

Rüppell, N. W. Fische, p. 125. taf. 31. f. 2 ; *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Man. en Makass.* p. 46.

B. 6. D. $\frac{13}{18}$. A. $\frac{2}{6-7}$. L. lat. 75–80.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head four times. Dorsal fin nearly even, caudal slightly rounded. Brown, with three white bands on each side : the first from the vertex along the base of the spinous dorsal to the last dorsal spine ; the second from above the eye to the back of the tail ; the third from below the eye to the inferior side of the tail. Fins yellowish ; the soft dorsal with two brown longitudinal bands ; the caudal fin with a median band, and two oblique ones on each lobe, all of a brown colour.

Red Sea ; Sea of Manado.

22. Diagramma lineatum.

Seba, iii. 27. 18 ; *Benn. Ceyl. Fish.* p. 13. f. 13.
Perca diagramma, *L. Gm.* p. 1319.
—— lineata, *L. Gm.* p. 1319.
Sciæna lineata, *L. Mus. Ad. Frid.* t. 31. f. 4.
—— abu mgaterin, *Forsk.* p. 51.
Grammistes lineatus, *Bl. Schn.* p. 186.
Diagramma lineatum, *Cuv. & Val.* v. p. 309 ; *Bleek. Amboina*, iii. p. 22.

B. 6. D. $\frac{12}{20}$. A. $\frac{3}{7}$. L. lat. 75.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $4\frac{1}{2}$. The fourth dorsal spine longest, about half the depth of the body ; caudalis rounded ; the second anal spine longer than the third. Brown, with six yellowish longitudinal bands: the first along the middle of the neck and occiput; the second from the eye to the middle of the base of the soft dorsal; the third, broader, from the eye to the back of the tail, and continuing on the caudal; the fourth from the eye to the root of the caudal; the fifth from the snout to the lower part of the caudal; the sixth from the mouth to the anal. Fins yellow; the anal and dorsal fins with a basal and marginal black band, the basal of the latter widening posteriorly, and extending to the top of the soft portion; caudal fin with a median black band, and with two other oblique ones on each lobe; pectoral with three spots, ventral with one large brown spot.

23. Diagramma radja

Bleeker, Amboina, iv. p. 366.

B. 6. D. $\frac{13}{19}$. A. $\frac{3}{7}$. L. lat. 75.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $4\frac{1}{3}$; the diameter of the eye is $3\frac{1}{4}$ in the latter; the fourth and fifth dorsal spines longest, one-third of the height of the body. Caudalis rounded; the second anal spine longer than the third. Yellow, with eight or nine black longitudinal bands, the fourth of which runs from the eye to the caudal. The spinous dorsal with a basal and with a marginal black band, continued on the soft portion; the caudal with a median longitudinal band, and with four or five oblique streaks above and beneath; the anal with some blackish spots; pectoral with a blackish spot at the base; ventral immaculate. (*Bl.*)

Sea of Amboyna.

24. Diagramma sebæ.

Seba, iii. 27. 17.

Diagramma sebæ, *Bleek. Verh. Batav. Genootsch.* xxiii. *Sciæn.* p. 24.

D. $\frac{13}{18}$. A. $\frac{3}{7}$. L. lat. 80.

The height of the body is $3\frac{2}{3}$ in the total length, the length of the head four times; the diameter of the eye is 3–$3\frac{1}{2}$ in the latter. The second, third and fourth dorsal spines are the longest, and $2\frac{2}{3}$ or three times in the height of the body, the last is the shortest; the second spine of the anal fin longest, and one-third of the height of the body. Caudalis truncated. Yellowish, with seven brown longitudinal bands; the vertical fins black-edged and spotted with blackish; pectoral and ventral fins yellow, the former with a red spot at the base. (*Bl.*)

Sea of Batavia and Banda Neira.

25. Diagramma goldmanni.

Bleeker, Ternate, ii. p. 602.

B. 6. D. $\frac{12}{19}$. A. $\frac{3}{7}$. L. lat. 65–70.

The height of the body is $3\frac{2}{5}$ in the total length, the length of the

head $4\frac{1}{4}$; the diameter of the eye is about one-third of the latter; the third and fourth dorsal spines longest, nearly one-third of the height of the body. Caudalis truncated; the second anal spine scarcely longer than the third. Yellow, with ten or eleven blackish-brown oblique longitudinal bands edged with blue: the first from the middle of the nape to the base of the fourth dorsal spine; the second and third from above the head to the base of the spinous dorsal; the fourth, fifth and sixth from the eye to the base of the soft dorsal; the seventh from below the eye to the end of the dorsal; the eighth from below the eye to the caudal; the ninth from the mouth to the caudal; the tenth along the belly. Dorsal fin above black-edged, and with a series of round black spots. Caudal and anal fins without bands, with a few large black spots; pectoral and ventral fins immaculate, above the base of the former a large sanguineous spot. (*Bl.*)

Sea of Ternate.

26. **Diagramma hæmatochir.**

Bleeker in Natuurk. Tydschr. Nederl. Indie, 1854, p. 175.

B. 6. D. $\frac{12}{20}$. A. $\frac{3}{7}$. L. lat. 80.

The height of the body is $3\frac{3}{4}$ in the total length, the length of the head $4\frac{1}{2}$; the diameter of the eye is one-fourth of the latter; the third and fourth dorsal spines longest, nearly one-third of the height of the body. Caudalis truncated. Yellowish; the snout brownish, with two white, curved cross-bands between the eyes; on each side about seventeen oblique blackish-brown bands: one along the middle of the neck, eight from the head to the back, and the others from the side of the belly to the back; no bands below the eye. The vertical fins black-edged; the spinous dorsal with one series of blackish-brown spots, the soft with two; caudalis with numerous, analis with scarce spots. A large sanguineous spot above the base of the pectoral fin. (*Bl.*)

Sea of Ternate.

27. **Diagramma polytænia.**

Bleeker, Celebes, iii. p. 755 (not *Solor,* p. 68).

B. 6. D. $\frac{12}{22}$. A. $\frac{3}{7}$. L. lat. 100.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $4\frac{1}{5}$; the diameter of the eye is $3\frac{2}{3}$ in the latter; the third, fourth and fifth dorsal spines longest, one-third of the height of the body. Caudalis truncated; the second anal spine longer than the third. Yellow, with nine bluish-white longitudinal bands edged with black, the four upper ones terminating at the base of the dorsal, the four next at the caudal, the lowest near the anus. (*Bl.*)

Sea of Macassar. (Port Essington.)

a. ? Adult: skin: not good state. Port Essington. Presented by the Earl of Derby.

28. Diagramma polytænioides.

Diagramma polytænia, *Bleek. Natuurk. Tydschr. Nederl. Indie*, v. p. 68 (not *l. c.* iii. p. 755).
—— polytænioides, *Bleek. l. c.* vi. p. 377.

B. 6. D. $\frac{12}{21}$. A. $\frac{3}{7}$. L. lat. 85.

The height of the body is $3\frac{2}{3}$ in the total length, the length of the head $4\frac{2}{3}$; the diameter of the eye is $3\frac{1}{2}$ or $3\frac{2}{3}$ in the latter. The fourth dorsal spine longest, rather longer than one-third of the height of the body; the second anal spine longer than the third. Yellow, with nine bluish-white longitudinal bands edged with brown; the three upper ones running from the crown to the base of the dorsal fin; the fourth, fifth and sixth from the side of the head to the caudal fin; the seventh and eighth from the head to the anal; the ninth from the head to the belly. The caudal brownish violet, with nine or ten oblique bluish-white streaks; the other fins yellow; the pectorals with three brownish cross-bars; the anal with two or three white oblique bands; the soft portion of the dorsal with three brown longitudinal bands.

Sea of Solor; Amboyna.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.
b. Adult. Amboyna. Purchased of Mr. Frank.—I consider this specimen as a variety of *D. polytænioides*. It has six white longitudinal bands only, but the same numbers of the fins, the same spinous dorsal fin of nearly uniform yellow, and two cross-bars on the pectorals.

29. Diagramma chrysotænia.

Bleeker, Celebes, viii. p. 303.

B. 6. D. $\frac{13}{20}$. A. $\frac{3}{7}$. L. lat. 65.

The height of the body is $3\frac{2}{5}$ in the total length, the length of the head one-fourth; the diameter of the eye is one-third of the length of the head. Caudalis subtruncated; the second anal spine longer and stronger than the third. Above bluish; on each side eight orange-coloured longitudinal bands: the first from the neck along the base of the spinous dorsal, continuing on the soft portion of this fin; the second from the forehead, extending on the posterior quarter of the soft dorsal; the third from the snout above the eye and the lateral line to the back of the tail; the fourth from the eye to the upper half of the root of the caudal; the fifth from the eye to the middle of the caudal; the sixth from below the eye to the lower half of the root of the caudal; the seventh from the mouth to the lower margin of the caudal; the eighth from the mouth to the base of the anal. A median yellow band from the snout to the origin of the dorsal. The dorsal and caudal fins brown-edged; the spinous portion of the former with two, the soft with three yellow longitudinal bands; the other fins yellow. (*Bl.*)

Sea of Macassar.

30. Diagramma reticulatum.

D. $\frac{13}{21-22}$. A. $\frac{3}{7}$. L. lat. 85. L. transv. 13/25.

The height of the body is $3\frac{1}{4}$ in the total length, the length of the head four times. Caudalis truncated; the second anal spine is stronger, but scarcely longer than the third. Brownish grey (in a dried state), reticulated with darker waved lines; three longitudinal bands on the opercles.

Chinese Seas.

a. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
b. Adult: stuffed. China. Purchased of Mr. Warwick.

Description.—The greatest depth of the body is above the pectoral fins, where it is contained $3\frac{1}{4}$ in the total length; the upper profile descends parabolically from the fifth dorsal spine to the mouth. The cleft of the mouth is horizontal and rather small, the upper maxillary not extending to the anterior margin of the orbit. The snout is much longer than the diameter of the eye, which is one-fourth of the length of the head. The lips are thick and fleshy. The scales above extend to between the nostrils, laterally on the posterior portion of the præorbital. The scales of the cheek are very small, and cover the præoperculum to its margin. The præoperculum is distinctly and equally serrated, and has the angle and the inferior limb rounded. The operculum has two obtuse points, with a slight notch between. Suprascapula serrated.

The *dorsal* fin begins above the suprascapula, and ends above the middle of the distance between the anal and caudal fins; the length of its spinous portion is rather more than that of the soft, and the distance from the caudal fin equals that between the first and fifth dorsal spines. The upper margin is continuous and slightly waved. The spines are of moderate strength, on one side broader. The first spine is three-fifths of the length of the second, the second three-quarters of the third, the third rather shorter than the fourth, fifth and sixth, which are the longest, and about $3\frac{1}{4}$ in the height of the body. The posterior spines gradually decrease in length, the last being about equal to the second. The first ray is longer than the preceding spine; the following rays become gradually longer to the tenth, which, together with the following three or four, form the highest portion of the fin, even higher than the longest spine; the posterior rays decrease again in length, and form a rounded angle of the fin. The spinous portion moves in a scaly sheath, which becomes deeper and more conspicuous from the seventh spine; the soft portion is covered with scales for half its height.

The *caudal* fin is truncated; one of its longest rays is one-fifth of the total length. Minute scales extend between the rays to one-half of the length of the fin. The origin of the *anal* fin falls vertically below the fifth ray of the dorsal, and the end below the fourteenth; the length of its base is rather more than one-half of its distance from the caudal. The first spine is small; the second strong, and equal to the longest ray of the dorsal; the third is rather shorter and much thinner. The first three rays exceed the spines in length.

and form, with the other shorter ones, a rounded margin. One-half of the fin is thickly covered with scales. The *pectoral* is slightly rounded, and its length $6\frac{1}{3}$ in the total. The *ventral* is rather shorter; its base falls immediately behind that of the pectoral; the spine is moderate, about two-thirds the length of the fin. Both the latter fins are far distant from the vent.

The *scales* are rather small, ctenoid; the lateral line is very slightly curved.

The *teeth* of the jaws are in villiform bands, the outer row containing rather larger ones.

The *coloration* is now brownish grey, with darker stripes, waved and anastomosing; the stripes have a more longitudinal direction on the anterior part of the body, and a more oblique one in the middle and posteriorly. There are three indistinct bands across the operculum.

	inches.	lines.
Total length	11	2
Height of the body	3	5
Length of the head	2	9
——— of the fourth dorsal spine	1	$0\frac{1}{2}$
——— of the thirteenth dorsal spine	0	9
——— of the eleventh dorsal ray	1	$2\frac{1}{2}$
——— of the longest caudal ray	2	2
——— of the second anal spine	1	2
Distance between caudal and dorsal fins	1	0
——— between anal and caudal fins	2	0

31. **Diagramma nitidum.** (PLATE XIX. fig. B.)

D. $\frac{12}{20}$. A. $\frac{3}{7}$. L. lat. 95. L. transv. 20/25.

The height of the body is $3\frac{1}{5}$ in the total length, the length of the head four times. Caudalis truncated. The second anal spine stronger, but scarcely longer, than the third. Reddish brown (in spirits), with six bluish, darker-edged, parallel, longitudinal bands: the first from the nape to the origin of the soft dorsal; the second from above the eye to the posterior third of the soft dorsal; the third from the eye on, and above, the lateral line to the back of the tail; the fourth from the eye below the lateral line to the middle of the tail; the fifth from below the eye to the inferior part of the caudal; the sixth from the mouth over the root of the pectoral to the end of the anal fin.

a. Australia. Presented by the Earl of Derby.

Description of the specimen.—The greatest depth of the body is above the pectoral fins, where it is contained $3\frac{1}{5}$ in the total length; the upper profile descends parabolically from the third dorsal spine to the mouth. The cleft of the mouth is horizontal and small, the upper maxillary not extending to the anterior margin of the orbit. The diameter of the eye is one-third of the length of the head, and more than the extent of the snout (perhaps in younger individuals only). There are three pairs of minute pores near the symphysis of the lower jaw. The scales above extend to between the nostrils, laterally nearly over all the præorbital. The scales of the cheek are not much smaller than those of the operculum, and cover the præoperculum to its margin. The præoperculum is distinctly and equally serrated, and has the angle and the inferior limb rounded; its posterior limb descends in a slightly oblique direction forwards. The operculum has two obtuse points with a slight notch between. Suprascapula serrated.

The *dorsal* fin begins above the base of the pectoral, and the vertical from its posterior end falls nearer to the anal than to the caudal; the length of its spinous portion is rather longer than that of the soft, and the distance from the caudal fin equals that between the first and sixth dorsal spines. The upper margin is continuous and slightly waved. The spines are of moderate strength, on one side broader. The first spine is one-half the length of the second, the second three-fifths of the third, the third rather shorter than the next four, which are the longest, and about $3\frac{1}{3}$ in the height of the body. The posterior spines scarcely decrease in height, the last being equal to the third. The first ray is rather longer than the preceding spine, and the following gradually become higher to the tenth, which forms the highest point of the fin—higher than the spinous dorsal; from thence they decrease again, forming a rounded angle of the fin. The spinous portion moves in a scaly sheath, which becomes deeper and more conspicuous from the fourth spine; the soft portion is covered with scales for half its height.

The *caudal* fin is truncated; one of its longest rays is one-fifth of the total length. Minute scales extend between the rays to one-half of the length of the fin. The origin of the *anal* fin falls vertically below the sixth ray of the dorsal, and the end below the eleventh; the length of its base is one-half of the distance from the caudal. The first spine is small; the second strong, and equal to the longest ray of the dorsal; the third is rather shorter and more slender. The first three rays exceed the spines in length, and form, with the other shorter ones, a rounded margin. One-half of the fin is thickly covered with scales. The *pectoral* is slightly rounded, and its length is one-sixth of the total; the ventral has the same length, and extends to the vent. Its base falls immediately behind that of the pectoral. The spine is moderate, about two-thirds of the length of the fin.

The *scales* are small, ctenoid. The lateral line is slightly curved.

The *teeth* of the jaws stand in villiform bands, the outer row containing rather larger ones.

To the description of the *colours* given above, must be added, that the fins appear to be immaculate, and that the lower portion of the side of the head is silvery shining.

	inches.	lines.
Total length	4	6
Height of the body	1	5
Length of the head	1	2

	inches.	lines
Diameter of the eye	0	5
Length of the fifth dorsal spine	0	5
——— of the twelfth dorsal spine	0	$4\frac{1}{2}$
——— of the tenth dorsal ray	0	7
——— of the longest caudal ray	0	11
——— of the second anal spine	0	7
Distance between dorsal and caudal fins	0	$5\frac{1}{2}$
——— between anal and caudal fins	0	10

9. HYPEROGLYPHE*.

Diagramma, sp., *Richards. Ereb. & Terr. Fishes*, p. 26.

Body oblong, compressed. Eye moderate. Snout blunt; cleft of the mouth oblique, with the upper jaw longer. Two dorsals, scarcely united, the first much lower than the second, with eight short spines; anal fin with very feeble spines. Præorbital and præoperculum serrated; operculum spiniferous. Seven branchiostegals. Jaws with the teeth in villiform bands, without canines. Roof of the mouth with a deep longitudinal groove. Scales small, cycloid. (Pharyngeal bones separated from each other.) Air-bladder simple; pyloric appendages in great number.

Coasts of Australia.

1. Hyperoglyphe porosa.

Diagramma porosa, *Richards. Ereb. & Terr. Fishes*, p. 26. f. 5, 6.

B. 7. $D.\ 8 \,\Big|\, \frac{1}{20}$. $A.\ \frac{3}{16}$. L. lat. 95–100.

The upper maxillary reaches to below the middle of the eye; both limbs of the præoperculum ciliated. Caudalis slightly emarginate. Uniform brown (in spirits); the soft dorsal and anal fins with two series of dark-brown spots.

Coasts of Australia.

a. $5\frac{1}{2}$″ long. From the Haslar Collection.

10. LOBOTES†.

Lobotes, *Cuv. Règne Anim.*; *Cuv. & Val.* v. p. 318.

Form of the body and of the vertical fins rather elevated. Eye rather small. Snout blunt, with the lower jaw longer and the cleft of the mouth oblique. One dorsal, with twelve spines, the anal fin with three. Caudalis rounded. No canines (inferior pharyngeal bones separated). Præoperculum denticulated; operculum with obtuse points. Scales moderate, ctenoid. Branchiostegals six. Air-bladder simple; pyloric appendages few. Pseudobranchiæ developed.

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* From *ὑπὲρ*, above, and *γλυφή*, groove.

† 1. Lobotes citrinus, *Richards. Ichth. China*, p. 237.
2. —— emarginatus, *Baird & Girard. Ninth Smithson. Report*, p. 332 (United States), does not appear to belong to this genus

Atlantic Coasts of America. Indian Seas.

1. Lobotes auctorum.

Holocentrus surinamensis, *Bl.* taf. 243; *Bl. Schn.* p. 316.
Bodianus triurus, *Mitch. Trans. Lit. & Phil. Soc. New York,* i. p. 418. pl. 3. f. 10.
Lobotes surinamensis, *Cuv. & Val.* v. p. 319; *Dekay, New York Fauna, Fishes,* p. 88. pl. 18. f. 49; *Holbr. Ichth. S. Carol.* p. 159. pl. 23. f. 2.
Lobotes erate, *Cuv. & Val.* v. p. 322; *Bleek. Verh. Bat. Genootsch.* xxii. p. 4, and xxiii. *Sciæn.* p. 26; *Cant. Catal.* p. 80; *Cuv. Règne Anim. Ill. Poiss.* pl. 31. f. 1.
—— farkharii, *Cuv. & Val.* v. p. 324.
—— somnolentus, *Cuv. & Val.* v. p. 324.
—— incurvus, *Richards. Ichth. Chin.* p. 237.

D. $\frac{12}{15-16}$. A. $\frac{3}{11}$. L. lat. 45. Cæc. pylor. 3. Vert. 13/11.

Caudal fin rounded; the soft dorsal and anal fins rather elevated; nape concave; eye small. Uniform brownish, yellowish, or blackish; caudal fin sometimes with a lighter edge.

Atlantic coasts of America from New York to the coast of Surinam; Caribbean Sea. Ceylon; Bay of Bengal; Sunda, Molucca, and Chinese Seas.

As in all fishes which attain to a considerable size, the individuals of this species are subjected to some modifications of several external characters; for instance, of the denticulations of the præoperculum, of the colours, and of the height of the fins. I cannot find any determinable difference between specimens from the old and new world. *Lobotes incurvus* is founded on a half-grown specimen, with the vertical fins scarcely longer than usual.

a. 22″ long: stuffed. North America. Purchased of Mr. Warwick.
b. Half-grown. Cuba. From the Collection of the Zoological Society.
c, d. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.
e. 22″ long: stuffed. Calcutta. Presented by E. Blyth, Esq.
f. Half-grown: stuffed. China. Presented by J. R. Reeves, Esq. —Original specimen of *Lobotes incurvus.*
g. Half-grown: stuffed. India. Purchased of Mr. Warwick.
h. Half-grown: stuffed.

11. DATNIOIDES.

Datnioides, *Bleeker, Natuurk. Tydschr. Nederl. Indie,* 1853, v. p. 440.

Body elevated. Eye moderate. Intermaxillaries very protractile, their posterior processes extending to the occiput. One dorsal fin, with a deep notch and twelve spines; the anal fin with three; all the spines very stout; caudalis rounded. Præoperculum serrated, operculum with short spines. Scales moderate or rather small, ctenoid. Six branchiostegals. Pseudobranchiæ. (The lower pharyngeal bones separated.) Air-bladder simple.

East Indian rivers.

1. Datnioides polota.

Coius polota, *Buch. Ham.* pp. 95, 370. pl. 38. f. 31; *Faun. Japon. Poiss* p. 17; *Richards. Ichth. Sulph.* p. 83.
—— binotatus, *Gray, Ind. Zool. Pisc.* pl. 2. f. 2; *Faun. Japon. Poiss.* p. 17; *Richards. Ichth. Sulph.* p. 83.
Datnia polota, *Cantor, Catal.* p. 16.
Lobotes hexazona, *Bleek. Natuurk. Tyds. Ned. Ind.* i. p. 9, ii. p. 165.
Datnioides polota, *Bleek. l. c.* v. p. 441.

B. 6. D. $\frac{12}{13}$. A. $\frac{3}{8-9}$. L. lat. 70.

Greenish, with eight blackish cross-bands.

Estuaries of the Ganges; rivers of Borneo and Sumatra.

a. Adult. Borneo.
b–h. Half-grown and young. India.
i. Young. India. Presented by W. Masters, Esq.

2. Datnioides microlepis.

Bleeker, Borneo, vii. p. 442.

B. 6. D. $\frac{12}{15}$. A. $\frac{3}{9}$. L. lat. 75–80.

Red, with eight black cross-bands.

River Kapuas (Borneo).

12. GERRES*.

Gerres, *Cuv. Règne Anim.*; *Cuv. & Val.* vi. p. 446.
Catochænum, *Cant. Catal.* p. 55.

Form of the body compressed, oblong or elevated. Mouth very protractile, and descending when thrust out. Eye rather large. Præoperculum generally entire. Six branchiostegals. No canine teeth. Dorsalis deeply notched, with the formula $\frac{9}{10}$; analis $\frac{3}{7\,(-9)}$. Caudal forked. Scales moderate, minutely or not ciliated. Air-bladder simple; pyloric appendages in small number. Pseudobranchiæ.

All the tropical seas, entering fresh waters. One species from the coast of North America.

* 1. Gerres bilobus, *Cuv. & Val.* vi. p. 466.—Cape Verde.
2. —— peruvianus, *Cuv. & Val.* vi. p. 467; *Less. Voy. Coq. Zool. Poiss.* p. 180.—Coast of Peru.
3. —— richii, *Cuv. & Val.* vi. p. 469.—East Indies?
4. Smaris lineatus, *Humboldt, Observ. Zool.* p. 185. pl. 46. f. 1.—Gerres lineatus, *Cuv. & Val.* vi. p. 470.—Acapulco.
5. Gerres limbatus, *Cuv. & Val.* vi. p. 476.—Catochænum limbatum, *Cant. Catal.* p. 55.—East Indies.
6. —— lucidus, *Cuv. & Val.* vi. p. 477.—Pondicherry.
7. —— waigiensis, *Quoy & Gaim. Voy. Freyc. Zool.* p. 292.—Waigiou.
8. Eucinostomus argenteus, *Baird & Gir. Ninth Smithson. Report*, p. 345, probably should be referred to this genus. The species being the most northern, is highly interesting; but the description given does not distinguish it from East Indian species.—Coast of New Jersey.

1. Gerres plumieri.

Cuv. & Val. vi. p. 452. pl. 167.

D. $\frac{9}{10}$ A. $\frac{3}{7-8}$. L. lat. 37. L. transv. 6/11. Vert. 10/14.

The height of the body is $2\frac{1}{5}$ in the total length (without caudal fin). Præorbital serrated; the second dorsal and anal spines exceedingly strong and long; the former slightly longer, nearly as long as the head. Silvery, with more or less distinct longitudinal stripes corresponding to the series of scales; dorsal generally blackish.

Atlantic coasts of Tropical America.

a. Fine specimen. S. Domingo. Purchased of Mr. Cuming.
b. Skeleton. S. Domingo. Purchased of Mr. Cuming.
c. Fine specimen. Central America. From M. Sallé's Collection.
d. Adult. Guatemala. Purchased of Mr. Frank.
e. Adult. Pernambuco. Presented by J. P. G. Smith, Esq.
f. Adult. Bahia. Purchased of M. Parzudaki.
g, h. Half-grown and young: skins. South America. From Dr. Parnell's Collection.

Air-bladder simple.

Skeleton.—The skull of *Gerres* exhibits several peculiarities by which it may be distinguished from any other: they are—the high, triangular occipital crest, with a deep groove in front, to receive two very elongate processes of the intermaxillary bones, the peculiar shape of the jaws, and the broad and strong pubic bones. The maxillary bone has a somewhat irregular form, is slightly curved, and has a broad shallow groove along its upper and posterior margin. The front part of the intermaxillary bones is broad and slightly excavated, not unlike the upper jaw of some Tortoises; the posterior processes are very slender, flexible, and extend backwards into a groove of the occipital crest situated on the posterior half of the frontal bones; the descending branch of the intermaxillary also is rather irregularly formed and bent. The mandibula has the inferior margin slightly concave; the front part of the dentary is rather flat and horizontal, whilst the posterior part, together with the adjacent portion of the articulary, forms a high and elevated ridge. The turbinal bones are very elongate, irregularly bent, and transformed into a half-channel. The præorbital is triangular, broadest anteriorly, and with the inferior margin distinctly serrated; the infraorbital arch, like the posterior part of the præorbital, is narrow, and without an interior plate. The head of the vomer forms an angular prominence, but without any teeth; the palatine bones are deeply grooved. The posterior margin of the præoperculum is nearly straight and minutely serrated; the angle is rounded, and armed with equal and coarse denticulations; the lower margin is straight and very distinctly serrated. The operculum is twice as deep as long, five-sided, with the posterior side slightly emarginate, and without prominent points; its inferior angle is very acute. The sub- and interoperculum are very thin; their inferior margins are entire, and form together a very strong curvature. The upper surface of the skull is furnished with a very high and strong triangular crest, sharply pointed above, and supported by two pairs of short and low ridges, one before the other. The occipital crest bifurcates anteriorly, forming the posterior end of a longitudinal groove, in which the processes of the intermaxillaries move, as in a sheath. The base of the skull is rather compressed. The humeral arch does not exhibit any peculiarity. The pubic bones form a very strong and broad triangular plate, and have the exterior ridges much developed.

There are ten abdominal and fourteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the caudal as 1 : 1·3. The ribs are moderately strong, and have a longitudinal groove anteriorly and posteriorly; the first rib is short, bent backwards, and has a short prominence at its outer curvature. The neural spines of the posterior abdominal vertebræ gradually become longer, and are furnished with a flat, transparent posterior ridge. The interneural spines of the spinous dorsal have a similar ridge anteriorly and posteriorly; and these ridges are so broad, that they do not leave a free space between them. The interneural belonging to the second dorsal spine is exceedingly strong, and nearly equals the first interhæmal; it is intercalated between the second and third neural spines. The first interhæmal, to which are joined the first and second anal spines, is trihedral, exceedingly strong, and attached to the hæmals of the tenth and eleventh vertebræ; its length equals that of the second vertebra to the ninth.

2. Gerres poeti.

Cuv. & Val. vi. p. 468; *Bleek. Verh. Bat. Genootsch.* xxiii. *Mænid.* p. 11.

D. $\frac{9}{10}$. A. $\frac{3}{7}$.

The diameter of the eye is $2\frac{1}{2}$ in the length of the head. Spines of the fins extremely strong and broad; the length of the third dorsal spine is $2\frac{1}{2}$ in the depth of the body, and its width is one-ninth of its own length. The second anal spine is rather shorter than the third, and one-third of the depth of the body; its width is one-fifth of its own length. Uniform silvery; dorsal above black-edged.

Coast of Mahé (entering the rivers); Sunda Sea.

3. Gerres rhombeus.

Sloane, Jamaica, ii. pl. 253. f. 1.
Gerres brasilianus, *Cuv. & Val.* vi. p. 458.
—— rhombeus, *Cuv. & Val.* vi. p. 459.

D. $\frac{9}{10}$. A. $\frac{2-3}{9-8}$. L. lat. 38. L. transv. 6/11. 9/15.

The height of the body is one-half of the total length (without caudal fin). Præorbital entire; præoperculum distinctly, interoperculum finely serrated. The spines moderate; the second of the dorsal two-thirds the length of the head, in young individuals as long as the head; the second of the anal three-fourths of the second of the dorsal. Silvery; dorsal with a blackish margin.

Atlantic coasts of Tropical America.

a. Fine specimen. Cuba. Presented by the Zoological Society.
b–f. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.
g. Adult: not good state. Puerto Capello. Purchased of Mr. Brandt.
h. Adult: not good state. South America. Purchased of Mr. Brandt.
i–l. Adult: not good state. South America. Purchased of Mr. Brandt.
m. Half-grown. South America. Presented by Sir R. Schomburgk.
n. Adult: skeleton. From the Haslar Collection.
o. Adult: skeleton. From the Collection of the Zoological Society.
p. Half-grown. From the Haslar Collection.
q. Young.

Skeleton.—I have had skeletons of the fish prepared with two anal spines as well as with three, and having found them exactly alike, I am fully convinced that the form with two anal spines is merely accidental in some individuals, and that *G. rhombeus* of Cuvier must be considered as a nominal species. I have, however, preferred the name of *G. rhombeus* to that of *G. brasiliensis*.

The skeleton differs from that of *G. plumieri* in several points. The maxillary bone is very irregularly shaped, and exhibits a thick protuberance in the middle of its outer surface; this is, however, more conspicuous in very old specimens. The intermaxillaries and the mandibula are very much like those of *G. plumieri*. The præorbital has the maxillary margin concave and entire; its posterior part is rather broader than the remainder of the infraorbital arch. The head of the vomer is rather flat, without a distinct prominence; the palatine bones exhibit a slight groove. Both the margins of the præoperculum are straight; the angle is rounded, and like the inferior limb armed with a very distinct and equal serrature; the posterior limb is entire. The remainder of the opercular apparatus as in *G. plumieri*. The occipital crest extends further forwards than in *G. plumieri*, the anterior groove being situated above the anterior portion of the frontal bones; there is, besides, this peculiarity in *G. rhombeus*, that the groove mentioned communicates with the orbital cavity by a pair of large oval holes.

There are nine abdominal and fifteen caudal *vertebræ*; the length of the former portion of the vertebral column being to that of the caudal as 1 : 1·8. The ribs are rather feeble, with a posterior and anterior longitudinal groove; the first three ribs are very slender, short, and without a prominent knob. The neural spines become gradually longer to the thirteenth vertebra, and are furnished with a more or less distinct, flat, transparent, posterior ridge. The interneural spines do not differ from those of *G. plumieri*, except that of the second dorsal spine, which, like that spine itself, is not quite so strong. The first interhæmal is exceedingly strong, and has in front a very broad and emarginate ridge; its length equals that of the first nine vertebræ.

4. **Gerres zebra.**

Müll. & Trosch. in Schomburgk's Barbad. p. 668.

D. $\frac{9}{10}$. A. $\frac{3}{7}$.

Silvery: steel-blue above; five or seven vertical bands. The height of the body is a third of its length, and contains two and a half times the length of the second and third spine in the dorsal fin, and three times of the second spine in the anal fin. (*M. & T.*)

Coast and freshwater ponds of Barbadoes.

5. **Gerres subfasciatus.**

Cuv. & Val. vi. p. 477.

D. $\frac{9}{10}$. A. $\frac{3}{7}$.

The height of the body is one-third of the total length; the snout is rather shorter than the diameter of the eye. Spines of the fins slender; the third of the dorsal fin is one-half of the height of the body, its width being less than one-twelfth of its own length. The second anal spine stronger, but rather shorter than the third, and about one-fifth of the height of the body. Silvery, with six or seven indistinct vertical bands.

Port Jackson.

a, b. Adult: bad state. From the Haslar Collection.
c–e. Half-grown: bad state. From the Haslar Collection.

6. **Gerres ovatus.** (PLATE XX. fig. A.)

D. $\frac{9}{10-11}$. A. $\frac{3}{7}$. L. lat. 36. L. transv. 5/10.

The height of the body is $2\frac{1}{4}$ in the total length (without caudal fin); the diameter of the eye is one-third of the length of the head, longer than the snout, and equal to the distance between the eyes. The groove for the processes of the intermaxillary bones is short, and does not extend beyond the vertical from the anterior margin of the eye; there are no scales between that groove and the orbit. The spines of the dorsal slender and flexible; the second and third longest, and $2\frac{1}{2}$ in the height of the body; the third of the anal fin longest, shorter than the first ray, and nearly one-fourth of the height of the body. Coloration uniform; dorsalis black-edged.

Coast of Australia.

a. Adult. Australia. Presented by the Earl of Derby.
b. Adult. Australia. From Mr. Macgillivray's Collection.

Description.—The body is elevated, ovate, its greatest depth being above the ventral fin, where it is contained $2\frac{1}{4}$ in the total length (without caudal fin), or three times when this fin is included. The upper profile anteriorly descends abruptly from the origin of the dorsal, the lower ascends from the base of the mandibula; both meet at a not very acute angle. Posteriorly, along the base of the anal, the lower profile ascends more suddenly than the upper descends. The length of the head is $3\frac{1}{2}$ in the total, without caudal fin, or one-fifth of the same length, that fin included. The snout is shorter than the diameter of the eye, the upper maxillary extending to the anterior margin of the orbit. The groove for the processes of the intermaxillary bones is short, quadrangular, with a posterior and anterior angle and two lateral ones; it does not extend beyond the vertical from the anterior margin of the eye, and is entirely scaleless, as is the interspace between this groove and the orbit. The upper surface of the head is covered with large scales, to between the anterior part of the distance between the eyes. The nostrils are placed high up the sides, nearer the eye than the end of the snout; they are rather prominent, with the posterior opening wider. The præorbital is entirely scaleless: anteriorly broad, it is narrowest between the maxillary and the orbit. The scales of the cheeks are rather smaller than those of the body, and extend on the mandibula, there forming a narrow stripe immediately behind the maxillary. The præoperculum has a vertical posterior margin; the angle and the inferior limb are rounded, without any denticulations; the scales of the cheeks do not extend over its limbs. The operculum is irregularly quadrangular; its posterior side is emarginate; the inferior straight, slightly ascending backwards. The sub- and interoperculum are, like the operculum, covered with deciduous scales; their inferior margins are convex.

The *dorsal* fin is not very deeply notched; the length of the base of the spinous portion is shorter than of the soft, and its distance from the caudal is one-fifth only of that from the end of the snout; its origin is above the base of the pectoral, and its end a little before the vertical from the end of the anal fin. The spines are slender, and the anterior ones flexible; the first is minute; the second and third are the highest, and $2\frac{1}{2}$ in the depth of the body; the fourth, fifth and sixth decrease in length, the last four being nearly equal, and one-half of the third. The first ray is higher than the preceding spine, the other rays not differing very much from it in height, and forming together a slightly convex margin, with the membrane between deeply notched. There are eleven soft rays in one specimen, in the other ten. The *caudal* fin is deeply forked, the middle and shortest ray being $3\frac{1}{3}$ in the length of one of the outer and longest rays; the upper lobe is scarcely longer than the lower, and one-fourth of the total length; small, thin, and deciduous scales extend over the basal third of each lobe. The origin of the *anal* fin falls below the sixth dorsal ray, and its end a little behind that of the dorsal; the length of its base is more than its distance from the caudal, and equals five-eighths of the length of the head; it moves, like the dorsal, in a scaly sheath. The anterior spine is minute; the second stronger than the stoutest of the dorsal; the third is more slender, but longer than the second, and about one-fourth of the height of the body. The first ray is rather longer than the preceding spine, and the following rays diminish in length, so as to form a concave margin of the fin.

The *pectoral* fin is elongate, the middle rays being the longest; it does not fully extend to the origin of the anal, and is $3\frac{3}{5}$ in the total length; its base is entirely scaleless. The base of the *ventral* is at some distance behind that of the pectoral, and falls below the fourth dorsal spine; it does not extend to the vent, and is $6\frac{2}{3}$ in the total length; it is composed of one straight spine, two-thirds of the adjacent ray, and of five rays, the last of which is split into two branches to its base.

The *scales* are very thin, not ciliated, scarcely higher than long; one of the largest covers one-half of the eye. There is an exceedingly long squamose flap at the exterior base of the ventral. The lateral line is slightly curved.

The *teeth* are minute, in villiform bands.

The back is reddish olive, with some reflecting longitudinal streaks; the sides and the belly are silvery. The dorsal fin has a broad blackish margin, the other fins are colourless.

	inches.	lines.
Total length	6	8
Height of the body	2	3
Length of the head	1	4
Diameter of the eye	0	5
Length of the third dorsal spine	0	11
——— of the ninth dorsal spine	0	$5\frac{1}{2}$
——— of the middle caudal ray	0	6
——— of the upper caudal lobe	1	8
——— of the second anal spine	0	6
——— of the third anal spine	0	7
——— of the pectoral fin	1	10
——— of the ventral fin	1	0
——— of the squamous flap	0	9
——— of a scale	0	$3\frac{1}{3}$
Height of a scale	0	$3\frac{3}{4}$

7. Gerres abbreviatus.

Bleeker, Java, i. p. 103, and *Verh. Batav. Genootsch.* xxiii. *Mænid.* p. 11.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 33. L. transv. 5/10.

The height of the body is $2\frac{2}{3}$ in the total length; the diameter of the eye is one-third of the length of the head. Præorbital and præoperculum entire. The second spine of the dorsal fin more than one-half of the height of the body, and nearly equal to the length of the head. The second and third anal spines strong, and rather longer than the rays, one-third of the height of the body. Coloration uniform; dorsal black-edged.

Seas of Batavia and Amboyna.

Adult. Amboyna. Purchased of Mr. Frank.

8. Gerres filamentosus.

Russell, i. p. 52. pl. 68.

Gerres filamentosus, *Cuv. & Val.* vi. p. 482; *Bleeker, Verh. Bat. Genootsch.* xxiii. *Mænid.* p. 11.

Gerres punctatus, *Bleeker, Topogr. Batav.* (not *Cuv.*).
Catochænum filamentosum, *Cant. Catal.* p. 56.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 45. L. transv. 6/12.

The height of the body is $2\frac{1}{3}$ in the total length (without caudal fin). The spines of moderate strength; the second of the anal produced into a filament, which sometimes extends to the caudal.

Sea of Pinang; Sunda and Molucca Sea; New Guinea.

a. Adult: not good state. Molucca Sea. Purchased of Mr. Frank.
b. Adult: not good state. Molucca Sea. Purchased of Mr. Frank.
c. Adult: stuffed. Cape York (in 68 fathoms). Voyage of the Rattlesnake.

9. **Gerres punctatus.**

Cuv. & Val. vi. p. 480.

D. $\frac{9}{10}$. A. $\frac{3}{8}$.

The height of the body is $3\frac{1}{2}$ in the total length. The second dorsal spine prolonged into a short filament, and sometimes as long as three-quarters of the height of the body. Silvery; dorsal with a narrow black margin, each ray with a brown point at the base. Young individuals with indistinct cross-bands.

Coast of Pondicherry; Sea of China.

Gerres macracanthus (Bleeker, Natuurk. Tydschr. Nederl. Ind. 1854, vi. p. 195) may be founded on older individuals of the above species. (A. $\frac{3}{7}$. L. lat. 40.) Caught near Batavia.

a. Adult. Old Collection, as *Sparus edentulus*.
b, c. Young. China. Presented by J. R. Reeves, Esq.
d. Half-grown. Philippine Islands.
e. Half-grown. Presented by G. R. Waterhouse, Esq.

10. **Gerres gula.**

Cuv. & Val. vi. p. 464; *Jenyns, Zool. Beagle, Fishes,* p. 58.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 45. L. transv. 4/9. Vert. 9/15.

The height of the body is $2\frac{3}{4}$ in the total length (without caudal fin). Præorbital and præoperculum entire, the latter with the angle slightly rounded. The groove for the processes of the intermaxillaries extends nearly to the vertical from the centre of the eye; a transverse stripe of scales covers a part of the groove, separating from it the posterior third*. The snout is shorter than the diameter of the eye, and equal to the space between the eyes. The spines of the fins of moderate strength; the second and third of the dorsal half as long as the head, but twice as long as the second of the anal. Silvery: dorsal fin minutely dotted with brown; the dots more crowded at the top of the dorsal.

Atlantic coasts of Tropical America.

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* Space between the eyes with a fovea in the middle (*Jenyns, l. c.*)

a. Adult. Bahia. Purchased of M. Parzudaki.
b. Adult. Bahia. Purchased of M. Parzudaki.
c. Adult: skeleton. Bahia. Purchased of M. Parzudaki.
d. Half-grown. S. Domingo. Purchased of Mr. Cuming.
e, f. Young. Jamaica. From Mr. Gosse's Collection.
g. Adult. From the Haslar Collection.
h. Young.
i, k. Half-grown and young: skins.

Skeleton.—The very remarkable form of the first interhæmal spine has been mentioned by Cuvier. He states the number of the caudal vertebræ to be thirteen; but I have found fifteen, as in other species of *Gerres*. The length of the abdominal portion of the vertebral column is to that of the caudal as 1 : 1·6.

11. **Gerres nigri.** (PLATE XX. fig. B.)

D. $\frac{9}{10}$. A. $\frac{3}{8}$. L. lat. 42. L. transv. 5/11.

The height of the body is $2\frac{3}{5}$ in the total length (without caudal fin); the diameter of the eye is about one-third of the length of the head, rather longer than the snout, and equal to the distance between the eyes. The groove for the processes of the intermaxillary bones is elongate, triangular, reaching nearly to the vertical from the centre of the eye, and is entirely scaleless. Spines of the fins rather slender; the second of the dorsal is $2\frac{1}{5}$ in the height of the body, and nearly twice as long as the third of the anal, which is rather longer, but less stout, than the preceding. Silvery, with indistinct longitudinal stripes above the lateral line; the vertical fins blackish; dorsal black-edged.

Mouth of the River Niger.

a. Adult. River Niger. From Mr. Fraser's Collection.
b. Half-grown. Coast of Africa. From the Haslar Collection.

Description.—The body is moderately elevated, its greatest depth being below the origin of the dorsal, where it is contained $2\frac{1}{5}$ in the total length, without caudal fin, or $3\frac{1}{6}$ in the same length, the caudal included. The upper profile anteriorly and posteriorly descends as much as the lower ascends, and they meet in front at an acute angle. The length of the *head* is $3\frac{2}{5}$ in the total, without caudal fin. The snout is rather shorter than the diameter of the eye, the upper maxillary extending to the anterior margin of the eye. The groove for the processes of the intermaxillary bones is elongate, triangular, with a somewhat rounded posterior angle, and widening anteriorly. The scales of the upper surface of the skull do not extend over that groove, forming a stripe between the groove and the orbit, and terminating behind the nostrils, which are situated high up the sides, nearly halfway between the orbit and the end of the snout. The præorbital is entirely scaleless: anteriorly broad, it is narrowest between the maxillary and the orbit. The scales of the cheeks are smaller than those of the body, and extend in a narrow stripe on the mandibula, immediately behind the maxillary. The præoperculum is rounded, without any denticulations whatever; the scales of the cheeks do not extend on its limbs. The operculum is irregularly quadrangular; its posterior side is emarginate, the inferior straight, obliquely ascending backwards. The sub- and interoperculum are covered with deciduous scales, like the operculum; their inferior margin is slightly convex.

The *dorsal* fin is not very deeply notched; the length of the base of the spinous portion is shorter than of the soft, and its distance from the caudal is one-third only of that from the end of the snout; its origin is above the base of the ventral, its end a little before the vertical from the end of the anal fin. The spines are rather slender, but not flexible: the first is minute; the second the highest, and $2\frac{1}{5}$ in the height of the body; the third is a little, the fifth and sixth considerably shorter; the last three are nearly equal in length, and $2\frac{3}{5}$ in the length of the second. The first ray equals the sixth spine; the other rays not differing very much in height, and forming a slightly convex margin, with the membrane between deeply notched. The *caudal* fin is deeply forked, the middle and shortest ray being one-fifth only of the length of one of the outer and longest rays; the lobes are equal, and one-fourth of the total length: small, thin, and deciduous scales extend over the basal third of each lobe. The origin of the *anal* fin falls beneath the third ray of the dorsal, its end a little behind that of the dorsal. The length of its base is more than its distance from the caudal, and exactly equals the distance between the anterior margin of the eye and the hinder end of the operculum; it moves like the dorsal in a scaly sheath. The anterior spine is minute; the second rather stronger than the strongest of the dorsal; the third is more slender, but longer than the second, it is more than half of the second dorsal spine, and about one-sixth of the height of the body. The first ray is rather longer than the last spine, and the following rays diminish in length, so as to form a concave margin of the fin.

The *pectoral* fin is elongate, the middle rays being the longest; it reaches beyond the origin of the anal fin, and is one-fourth of the total length. The base of the *ventral* fin falls behind that of the pectoral; it does not extend to the vent, and is one-seventh only of the total length; it is composed of one slightly curved spine, three-fourths of the adjacent ray, and of five rays, the last of which, as in all the species of *Gerres*, is split into two branches to its base, so that there is an appearance of the fin having six soft rays.

The *scales* are deciduous, not ciliated, higher than long: one of the largest covers one-third of the eye. There is an exceedingly long squamous flap at the exterior base of the ventral. The lateral line is very slightly curved.

The *teeth* are minute, in villiform bands.

The back is reddish olive, with some reflecting longitudinal streaks; the sides and the belly are silvery. The vertical fins are blackish; the dorsal fin with a black edge. In the younger of the specimens the blackish colour of the dorsal fin forms two longitudinal series of spots.

	inches.	lines.
Total length	7	8
Height of the body	2	5
Length of the head	1	10
Diameter of the eye	0	7
Length of the second dorsal spine	1	1
——— of the ninth dorsal spine	0	5
——— of the middle caudal ray	0	$4\frac{1}{2}$
——— of a caudal lobe	1	10
——— of the second anal spine	0	$7\frac{1}{2}$
——— of the third anal spine	0	8
——— of the pectoral fin	1	11
——— of the ventral fin	1	1
——— of the squamous flap	0	10
——— of a scale	0	$3\frac{1}{2}$
Height of a scale	0	$4\frac{1}{3}$

12. Gerres squamipinnis. (PLATE XXI.)

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 43–44. L. transv. 5/13.

The height of the body is $2\frac{1}{2}$ in the total length (without caudal fin); the diameter of the eye is $3\frac{3}{5}$ in the length of the head, rather shorter than the snout, but equal to the distance between the eyes. The groove for the processes of the intermaxillary bones is broad, triangular, entirely scaleless, and does not reach to the vertical from the centre of the eye. The dorsal spines are rather slender and slightly compressed; the second is $1\frac{3}{5}$ in the length of the head. The second anal spine is rather strong, stronger and a little longer than the third: its length is $1\frac{2}{5}$ in that of the head: caudal fin deeply forked, entirely covered with scales; the length of a lobe is nearly $3\frac{1}{2}$ in the total. Uniform silvery; the margin of the dorsal fin blackish.

Caribbean Sea.

a–d. Adult: skins. Jamaica. From Dr. Parnell's Collection.
e. Half-grown: skin. Jamaica. From Dr. Parnell's Collection.
f. Adult: not good state. Guatemala. Purchased of Mr. Frank.

Description.—The body is moderately elevated, its greatest depth being below the anterior part of the spinous dorsal, where it is contained $2\frac{1}{2}$ in the total length, without caudal fin, or $3\frac{1}{2}$ in the same length, the caudal included. The upper profile, anteriorly and posteriorly, descends as much as the lower ascends, and they meet at an acute angle in front. The length of the head is $3\frac{1}{3}$ in the total, without caudal fin. The snout is rather longer than the diameter of the eye, and the upper maxillary extends slightly beyond the anterior margin of the eye; the part of the maxillary which is not hidden by the præorbital is rather elongate, ovate. The groove for the processes of the intermaxillary bones is rather broad, triangular, widening anteriorly, with a rounded posterior angle, which is situated in the vertical from the anterior third of the orbit. The scales of the upper surface of the skull do not extend over that groove, forming a stripe between the groove and the orbit, and terminating a little behind the nostrils, which are situated high up the sides, close to the orbit, and remote from the end of the snout. The præorbital is entirely scaleless, and without any denticulations; anteriorly broad, it is narrowest between the maxillary and the orbit; its maxillary margin is semilunate. The scales of the cheeks are rather smaller than those of the body, and extend on that part of the mandibula which is situated immediately behind the maxillary; they are arranged in four series on the præoperculum and in two on the mandibula. The angle and the inferior margin of the præoperculum form one curve: a narrow space along this curve is scaleless; it is about as wide as one of the scales of the cheek. The operculum is irregularly quadrangular, with the posterior side slightly emarginate; the inferior is straight, obliquely ascending backwards. The sub- and interoperculum are covered with deciduous scales, like the operculum; their inferior margins form one convexity.

The *dorsal* fin is not very deeply notched; the length of the base of the spinous portion is two-thirds of that of the soft, and the distance of the dorsal from the caudal is not quite one-third of that from the end of the snout; its origin is a little behind the vertical from the base of the ventrals, whilst the extremities of the dorsal and anal fins correspond to each other. The spines are rather slender: the first is very short; the second the highest and somewhat flexible, its length being $1\frac{2}{5}$ in that of the head, and $2\frac{1}{5}$ in the height of the body; the third is rather shorter; and the following gradually decrease in length to the last, which is one-half of the second. The first ray nearly equals the sixth spine. The *caudal* fin is entirely and densely covered with minute scales, and deeply forked, the middle and shortest ray being one-fifth only of the outer and longest rays; the upper lobe is rather longer than the lower, and nearly $3\frac{1}{2}$ in the total length. The origin of the *anal* fin falls beneath the fifth ray of the dorsal, whilst the extremities of both fins correspond to each other; the length of its base is rather more than its distance from the caudal, and rather less than the distance between the anterior margin of the eye and the hinder end of the operculum; it moves, like the dorsal, in a deep scaly sheath. The first spine is very short; the second strong, its length being $1\frac{2}{5}$ in that of the head, and $3\frac{1}{4}$ in the height of the body; the third is rather shorter, and half as stout as the second. The first ray has about the length of the second spine, whilst the following rays diminish in length, so as to form a concave margin of the fin.

The *pectoral* fin is rather elongate, the middle rays being the longest; it reaches nearly to the origin of the anal fin, and is $3\frac{3}{4}$ in the total length. The base of the *ventral* fin falls behind that of the pectoral; it is partly covered with stripes of minute scales; it does not reach to the vent, and is $6\frac{1}{3}$ in the total length; it is composed of one spine, slightly curved, and three-fourths of the adjacent ray, and of five rays, the last of which, as in all the species of *Gerres*, is split into two branches to its base.

The *scales* are not ciliated, higher than long; one of the largest covers one-third of the eye. There is an exceedingly long squamous flap at the exterior base of the ventral. The lateral line is very slightly curved.

The *teeth* are minute, in villiform bands.

The *colour* is uniform silvery, with shining longitudinal stripes; the upper half of the spinous dorsal is greyish.

	inches.	lines.
Total length	11	0
Height of the body	3	6
Length of the head	2	7
Diameter of the eye	0	$8\frac{1}{2}$
Length of the second dorsal spine	1	7
——— of the ninth dorsal spine	0	9
——— of a caudal lobe	3	2
——— of the second anal spine	1	1
——— of the third anal spine	1	$0\frac{1}{2}$
——— of the pectoral fin	3	0
——— of the ventral fin	1	9
——— of a scale	0	$4\frac{1}{3}$
Height of a scale	0	$5\frac{1}{3}$

13. Gerres japonicus.

Bleeker, Japan, p. 404, and *Verh. Bat. Gen.* xxvi. *Japan,* tab. 5. f. 2.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 40.

The height of the body is $2\frac{2}{3}$ in the total length (without caudal fin); the diameter of the eye is one-third of the length of the head. Præorbital and præoperculum entire. Spines of the fins slender; the second of the dorsal fin one-half of the depth of the body; the second of the anal longer than the third, or than one-half of the second dorsal spine; the caudal lobes are $4\frac{2}{3}$ or $4\frac{3}{4}$ in the total length. The spinous dorsal above black; caudal fin with a broad blackish margin.

Seas of Japan and China.

a. Half-grown: not good state. China. Presented by J. R. Reeves, Esq.

14. Gerres acinaces.

Bleeker, Natuurk. Tydschr. Nederl. Indie, 1854, vi. p. 194.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 40–45.

The height of the body is about $3\frac{3}{4}$ in the total length; the diameter of the eye is $3\frac{1}{2}$ in the length of the head. The second dorsal spine longer than one-half of the height of the body, but much shorter than the head; the second of the anal longer than the third and than the rays, nearly one-half of the length of the head. Silvery; caudalis brown-edged posteriorly. (*Bl.*)

Sea of Batavia.

This species appears to be very similar to *Gerres squamipinnis*; but the latter has the caudal fin so thickly covered with scales, that I do not believe that Bleeker would have omitted so conspicuous a character if it were also present in *G. acinaces*.

15. **Gerres kapas.**

Bleeker, Riouw, p. 482.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 32.

The height of the body is $3\frac{1}{5}$–$3\frac{1}{2}$ in the total length. The spines of the fins slender; the second and third of the dorsal fin one-half of the height of the body; the second and third of the anal not longer than the rays, and contained three or four times in the height of the body. Silvery: above greyish; the spinous dorsal black-edged. (*Bl.*)

Sea of Batavia.

16. **Gerres aprion.**

Cuv. & Val. vi. p. 461.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 45. L. transv. 6/10. Cæc. pylor. 3.

The height of the body is one-third of the total length (without caudal fin). Præorbital and præoperculum entire, the latter with the angle slightly rounded. The groove for the processes of the intermaxillaries extends to the vertical from the centre of the eye, is elongate, and entirely free of scales. The snout is slightly longer than the diameter of the eye, which exceeds the width of the head between the eyes. The spines of the fins moderate; the second of the dorsal is longer than one-half of the length of the head, and nearly twice as long as the second of the anal. Silvery: a deep-black spot at the top of the dorsal fin; the upper part of the snout blackish brown.

Atlantic coasts of Tropical America.

a. Fine specimen. S. Domingo. Purchased of Mr. Cuming.
b. Half-grown. S. Domingo. Purchased of Mr. Cuming.
c–h. Adult, half-grown, and young: skins. Jamaica. From Dr. Parnell's Collection.
i–l. Adult: bad state. West Indies.
m. Half-grown: skin: bad state. West Indies. Purchased of Mr. Scrivener.
n. Adult. South America. Presented by Lord Stuart.
o. Adult. South America. Presented by Lord Stuart.
p. Half-grown.
q. Half-grown.
r. Half-grown.
s. Adult: skin.

17. **Gerres oyena.**

Labrus oyena, *Forsk.* p. 35; *Bl. Schn.* p. 245; *Lacép.* iii. p. 463.
Sparus erythrurus, *Bl.* tab. 261 (very bad).
Cichla erythrura, *Bl. Schn.* p. 336.

Sparus britannus, *Lacép.* iv. pp. 132, 134.
Labrus longirostris, *Lacép.* iii. p. 467. pl. 19. f. 1.
Smaris oyena, *Rüpp. Atl.* p. 11. taf. 3. f. 2.
Gerres oyena, *Cuv. & Val.* vi. p. 472; ? *Jenyns, Zool. Beagle, Fishes,* p. 59; *Bleek. Verh. Bat. Gen.* xxiii. *Mænid.* p. 12.
—— oblongus, *Bleek. Topogr. Batav.* (not *Cuv.*).
? Gerres equula, *Temm. & Schleg. Faun. Japon. Poiss.* p. 76. pl. 40. f. 1 (not good); *Bleek. Verhand. Batav. Genootsch.* xxvi. p. 92.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 35–38. Cæc. pylor. 3. Vert. 10/14.

The height of the body is $2\frac{3}{4}$ in the total length (without caudal fin). Præorbital and præoperculum entire, the latter with the angle slightly rounded. The snout is slightly longer than the diameter of the eye, which is one-third of the length of the head. The spines of the fins moderate; the second of the dorsal is one-half of the height of the body, and at least twice as long as the second of the anal. Uniform silvery.

Red Sea; Isle de France; Sunda Sea (Japanese Sea?).

a. Adult: bad state. Old Collection.
b, c. Half-grown: bad state. From the Haslar Collection.

18. Gerres macrosoma.

Bleeker, Gilolo, p. 56.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 42.

The height of the body is four times in the total length (one-third without caudal), the length of the head $4\frac{2}{3}$ to $4\frac{3}{5}$; the diameter of the eye is one-third of the latter, and rather shorter than the snout; the interspace between the eyes is rather less than the width of the orbit. The groove for the processes of the intermaxillary bones is entirely scaleless, and does not extend to the vertical from the centre of the eye. The spines of the fins are slender; the second of the dorsal $1\frac{3}{4}$ in the height of the body; the second of the anal shorter than the third. Silvery: each spine and ray of the dorsal with a brown basal spot; the spinous portion black-edged.

Seas of Gilolo and Amboyna.

a. Half-grown. Amboyna. Purchased of Mr. Frank.

19. Gerres argyreus.

Sciæna argyrea, *Forster.*
Cichla argyrea, *Bl. Schn.* p. 344.
Gerres waigiensis, *Quoy & Gaim. Voy. Freyc. Zool.* p. 292
—— argyreus, *Cuv. & Val.* vi. p. 478.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 45.

The height of the body is scarcely more than the length of the head, and one-third of the total (without caudal fin); the diameter of the eye is one-third of the length of the head, and rather longer than the snout, the extent of which equals the distance between the eyes. The groove for the processes of the intermaxillary bones is entirely scaleless, and does not extend to the vertical from the centre of the eye. The spines of the fins are slender; the second of the dorsal is one-half of the height of the body, and more than twice the length of the second anal spine, which is rather stronger, but not longer. than the third. Silvery; top of the dorsal blackish.

Red Sea; Seas of Waigiou, Strong, and Tanna; Port Jackson.

a. Adult. From the Haslar Collection.
b. Adult. From the Haslar Collection.
c, *d*. Adult: skins: not good state. Port Jackson. Purchased of J. Gould, Esq.

20. Gerres oblongus.

Cuv. & Val. vi. p. 479.

D. $\frac{9}{10}$. A. $\frac{3}{7}$.

The height of the body is less than one-fourth of the total length. Spines of the fins slender. Silvery, with five or six indistinct brownish vertical bands. Lateral line nearly straight. (*Cuv.*)

Sea of Ceylon.

13. SCOLOPSIS*.

Scolopsides, *Cuv. Règne Anim.*; *Cuv. & Val.* v. p. 327.

Form of the body oblong. Eye moderate. Snout moderate, with the cleft of the mouth nearly horizontal and the jaws equal. One dorsal; the number of the fins—D. $\frac{10}{9\,(8)}$. A. $\frac{3}{7\,(6)}$; caudalis more or less forked. Infraorbital arch with a spine directed backwards. Præoperculum generally distinctly denticulated; operculum with an indistinct spine. Scales moderately ctenoid. Five branchiostegals. Pseudobranchiæ. Air-bladder simple; pyloric appendages few.

From the Red Sea through the Indian Ocean into the Pacific.

1. Scolopsis japonicus.

Anthias japonicus, *Bloch*, taf. 325. f. 2; *Bl. Schn.* p. 307.
Lutjanus japonicus, *Lacép.* iv. p. 31.
Kurite, *Russell*, pl. 106.
Scolopsis kate, *Cuv. & Val.* v. p. 329.
—— kurite, *Rüpp. Atl. Fische*, p. 9. taf. 2. f. 3; *Cuv. & Val.* v. p. 331.
Scolopsides rüppelii, *Cuv. & Val.* v. p. 332; *Richardson, Ichth. China*, p. 236.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 41–44. L. transv. $\frac{5}{16}$.

The height of the body is nearly one-third of the total length, the length of the head one-fourth; the diameter of the eye is about one-third of the latter, and longer than the snout. The infraorbital ring with two prominent spines; the anterior spiniferous plate rather elevated, and denticulated beneath the spine; præoperculum with a slight notch above the angle. The spines of the fins strong; the second of the anal fin longer and rather stronger than the third, nearly one-half of the length of the head. Caudalis slightly forked. Coloration uniform.

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* 1. Scolopsides pomotis, *Richardson, Ichth. China*, p. 237.
2. —— tæniopterus, *Cuv. & Val.* v. p. 345; *Bleek. Verh. Bat. Gen.* xxiii. *Sciæn.* p. 29.—Batavia

Red Sea; Coast of Pondicherry; Chinese Sea.

a. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
b, c. Adult: skins. Ceylon. Collected by E. F. Kelaart, M.D.

The notice given by Sir J. Richardson (*l. c.*) is taken from specimen *a.*; it shows the two infraorbital spines, one of which is directed backwards, the other forwards, as conspicuously as in any species of *Scolopsis*. Therefore the statement of Sir J. Richardson, "two suborbitar teeth pointing backwards, one under the other and more slender, none pointing forwards," is erroneous.

2. Scolopsis margaritifer.

Cuv. & Val. v. p. 337; *Bleeker, Verhand. Batav. Genootsch.* xxiii. *Sciæn.* p. 30.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 40. L. transv. 4/15.

The height of the body is $3\frac{1}{5}$–$3\frac{1}{3}$ in the total length, the length of the head $4\frac{1}{3}$–$4\frac{1}{2}$; the diameter of the eye is $2\frac{3}{4}$ in the latter, longer than the snout, and equal to the distance between the eyes. Præorbital half as wide as the orbit, with a very long and strong spine, and some denticulations beneath; the second (third) infraorbital terminating posteriorly in a small point, above the tip of the large spine. Præoperculum with strong and short spinous teeth, each of which has a small hook at the base; the angle projecting backwards, strongly armed. The spines of the fins moderate; the second of the anal stronger, but rather shorter than the third, which is $2\frac{2}{3}$ in the length of the head. Caudalis forked, the upper lobe longest. Greenish olive, each scale with a pearl-coloured base. The marginal half of the dorsal violet.

Sea of Batavia; Waigiou.

a. Fine specimen. From the Haslar Collection.

3. Scolopsis ciliatus.

Holocentrus ciliatus, *Lacép.* iv. pp. 333, 371.
Lycogenis argyrosoma, *Kuhl & van Hasselt.*
Scolopsides lycogenis, *Cuv. & Val.* v. p. 346. pl. 127.

B. 5. D. $\frac{10}{8\text{-}9}$. A. $\frac{3}{7}$. L. lat. 41. L. transv. 4/15. Cæc. pylor. 5. Vert. 10/14.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $4\frac{1}{2}$; the snout is rather shorter than the diameter of the eye, which is one-third of the length of the head, and equal to the interspace between the eyes. The upper maxillary armed with a prominent serrated longitudinal ridge, and extending to the vertical from the front margin of the eye; the infraorbital arch with two prominent spines of nearly equal size. Præoperculum with stronger spinous teeth at the angle, but the angle not prominent. Operculum with a conspicuous spine. Spines of the fins slender; the third of the anal fin longer than the second. Caudalis emarginate. A shining white longitudinal band between the lateral line and the middle of the dorsal fin.

Seas of Java, Amboyna, New Guinea, and Vanicolo.

a. Adult. Amboyna. Purchased of Mr. Frank.
b. Adult. Amboyna. From Madame Ida Pfeiffer's Collection.

4. **Scolopsis auratus.**

Perca aurata, *Mungo Park, Trans. Linn. Soc.* iii. p. 35.
Anthias vosmeri, *Bl.* tab. 321; *Bl. Schn.* p. 304.
Lutjanus vosmeri, *Lacép.* iv. p. 213.
—— aureovittatus, *Lacép.* iv. p. 216.
Pomacentrus enneadactylus, *Lacép.* iv. pp. 505, 508.
Scolopsides vosmeri, *Cuv. & Val.* v. p. 333; *Bleek. Verh. Bat. Genootsch.* xxiii. *Sciæn.* p. 27.
Scolopsis aurata, *Cant. Catal.* p. 81.

D. $\frac{10}{9}$. A. $\frac{3}{7}$.

The height of the body is $2\frac{1}{2}$ in the total length, the length of the head about four times; the diameter of the eye is one-third of the latter. The infraorbital arch with two prominent spines, and the anterior spiniferous plate denticulated beneath the spine; a part of the præopercular teeth bent outwards, and most of them with a minute spine at the base, pointing downwards; the second anal spine longest and strongest, the first half its length. A silvery longitudinal band beneath the lateral line, terminating opposite the soft dorsal fin.

Seas of Java, Sumatra, and Pinang.

5. **Scolopsis torquatus.**

Cuv. & Val. v. p. 335; *Bleek. Verh. Batav. Genootsch.* xxiii. p. 28.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 41–42. L. transv. 4/15.

Body rather elevated; snout short; præorbital spine strong; angle of præoperculum projecting; the spines of the fins rather strong; the second of the anal fin longer than the third. A broad yellowish cross-band from the nape over the operculum.

Sea of Batavia; Molucca Sea.

a. Fine specimen. Moluccas (as *Scolopsides collaris*).
b. Adult. India.

6. Scolopsis bilineatus.

Anthias bilineatus, *Bloch*, taf. 325. f. 1; *Bl. Schn.* p. 306.
Lutjanus ellipticus, *Lacép.* iv. p. 213.
Scolopsides bilineatus, *Cuv. & Val.* v. p. 336; *Bleek. Verh. Bat. Genootsch.* xxiii. *Sciæn.* p. 28.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 46. L. transv. 4/15.

The snout is short, shorter than the diameter of the eye; the interspace between the eyes exceeds the diameter. Præoperculum notched above the angle. A yellowish band, edged with brown, ascends from the angle of the mouth in a slight curve upwards to the origin of the soft dorsal; a yellowish blotch on the back, below the posterior two-thirds of the soft dorsal. A yellow line from the origin of the dorsal to the middle of the forehead; another, parallel, above the eye; a third through the eye, joining that of the other side on the muzzle. Dorsal fin white, with a broad black streak on the marginal half of the soft portion; anal black in its anterior half, white in its posterior.

Seas of Amboyna and Celebes.

a. Adult. Amboyna. Purchased of Mr. Frank.
b. Half-grown. Celebes.
c. Adult. Old Collection, as *Perca frenata*.

7. Scolopsis bimaculatus.

Scolopsis bimaculatus, *Rüpp. Atl. Fische*, p. 8. pl. 2. f. 2, and *N. W. Fische*, p. 126; *Cuv. & Val.* v. p. 340.
Scolopsides tæniatus, (*Ehrenb.*) *Cuv. & Val. l. c.*
—— inermis, *Rich. Ichth. China*, p. 236 (not *Schleg.*).

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 47. L. transv. 4/15.

The height of the body is $3\frac{1}{3}$ in the total length, the length of the head four times. The diameter of the eye is one-third of the length of the head, and rather longer than the snout, or the interspace between the eyes. Infraorbital arch with one strong spine; the spiniferous plate rather elevated, with several denticulations beneath the spine. Præoperculum with the angle projecting. Spines of the fins rather slender; the third of the anal fin somewhat longer and not thinner than the second. Caudalis slightly forked. Rose-coloured, with a large oblong blackish blotch in the middle of the total length

Red Sea; Ceylon; Chinese Seas.

a. Adult: stuffed. China Seas. Presented by J. R. Reeves, Esq.
b. Fine specimen.

8. Scolopsis inermis.

Temm. & Schleg. Faun. Japon. Poiss. p. 63. pl. 28. f. 1; *Bleek. Verh. Batav. Genootsch.* xxvi. p. 83.— *Richards. Ichth. China*, p. 236, belongs to *Sc. bimaculatus.*]

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 30.

The height of the body is $3\frac{2}{5}$ to $3\frac{3}{5}$ in the total length, the length of the head $3\frac{2}{3}$ to 4; the diameter of the eye is a little less than one-third of the latter. The præorbital is only half as high as the eye, and has a short spine and some denticulations beneath. Præoperculum with the angle rounded, slightly denticulated. The anal spines strong, the second and third nearly equal; caudalis scarcely emarginate. Coloration uniform.

Japanese Sea.

9. Scolopsis monogramma.

Scolopsides monogramma, (*Kuhl & v. Hass.*) *Cuv. & Val.* v. p. 338; *Cuv. Règne Anim. Ill. Poiss.* pl. 31. f. 3; *Bleek. Verh. Batav. Gen.* xxiii. *Sciæn.* p. 29 (not synonymy).

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 46. L. transv. 4/16.

The height of the body is $3\frac{3}{5}$ in the total length, the length of the head $4\frac{2}{5}$; the diameter of the eye is nearly one-third of the length of the head, and rather longer than the snout, or the distance between the eyes. Præorbital two-thirds as high as the eye, with a flat strong spine and some denticulations beneath; præoperculum distinctly serrated at the angle and at the posterior limb, which is slightly emarginate. The spines of the fins moderate; the third of the anal fin a little longer than the second. Caudalis emarginate. Coloration uniform (in spirits).

Sea of Java; Molucca Sea.

a. Adult. Moluccas.
b. Adult. Amboyna. Purchased of Mr. Frank.

10. Scolopsis phæops.

Scolopsides phæops, *Bennett, Proc. Committ. Zool. Soc.* i. p. 165.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 44. L. transv. 5/17.

The height of the body is three times in the total length (without caudal fin), the length of the head $3\frac{1}{3}$; the snout is rather longer than the diameter of the eye, which is $3\frac{2}{5}$ in the length of the head. The præorbital is in the middle half as wide as the orbit, and armed with a flat strong spine and several spinous teeth; præoperculum with strong spinous teeth, and with a notch above the projecting angle. Caudalis deeply forked, with both lobes produced into filaments. A silvery streak from the muzzle across the præorbital to the eye; another from the præorbital spine to the angle of the præoperculum. A light yellowish longitudinal band from over the eye, above and parallel to the lateral line, to the end of the dorsal.

Isle de France.

a. Fine specimen. Isle de France. From the Collection of the Zoological Society.—Type of the species.

Description of the specimen.—This species is rather elongated, the greatest depth of the body being one-third of the total length (without caudal fin). The head is rather broad and flat above, covered with scales nearly to the nostrils; all the snout is scaleless. The distance between the eyes is more than the width of the orbit or the extent of the snout. The cleft of the mouth is slightly oblique, moderate, the maxillary not reaching to the vertical from the anterior margin of the orbit. The præorbital is broadest between the eye and the top of the snout; it is composed, as in all the species of *Scolopsis*, of two pieces, the posterior of which is the spiniferous; its width in the middle, or in the suture between the two pieces, is one-half of that of the orbit. The spine is strong, flat, and pointed; and there are five spinous teeth besides, much smaller than the spine, but similar in shape: there is no spine pointing forwards. The præoperculum is scaly to its posterior margin, but part of its inferior limb is naked. There are six series of scales between the orbit and the angle of the præoperculum. The posterior limb descends obliquely forwards, and is armed with about twelve rather distant spinous teeth, the middle of which are strongest; the angle is rounded and projecting, and armed with about eight spinous teeth, more feeble than the strongest ones of the limb; the inferior limb is smooth, without teeth, and as long as the posterior. The operculum has a short and prominent spine, and is covered with scales of moderate size; even its basal margin is scaly. The suprascapula is finely serrated, and it can scarcely be distinguished from the surrounding scales.

The *dorsal* fin begins before the vertical from the base of the pectoral, and terminates a little behind the anal. The length of the base of the soft dorsal is $1\frac{3}{4}$ in that of the spinous. The spines are moderate, not flexible: the first is two-thirds of the second; the second is rather shorter than the following four, which are the longest, and one-third of the height of the body. The soft dorsal is rather higher, the sixth and seventh rays being the longest. The distance between the dorsal and caudal fins equals the height of the tail beneath the end of the dorsal. The *caudal* is deeply forked, each lobe being produced into a filament, the length of which equals that of the first dorsal ray; the upper lobe is slightly longer than the lower. The fin is nearly scaleless. The distance between the caudal and anal fins equals the height of the tail above the end of the latter. The *anal* fin begins beneath the second dorsal ray, and terminates a little before the dorsalis. The spines are rather stronger than those of the dorsal, and on one side broader than on the other: the first is nearly one-half of the second; the second three-quarters of the third, which is three times as long as the head. The margin of the soft portion is slightly rounded, the posterior rays gradually becoming shorter: the first ray is $2\frac{1}{4}$ in the length of the head. The *pectoral* fin is slightly pointed, scaly at the base only, and does not reach to the vent. The base of the *ventral* fin falls behind that of the pectoral; it is shorter, and also does not reach to the vent; the spine is two-thirds of the first ray.

The *scales* are of moderate size, finely crenated; much higher than long, and firmly adherent; one of the largest covers one-fifth of the eye.

The *ground-colour* is now greenish olive; the fins are colourless, The bands as described above.

	inches.	lines.
Total length	9	11
Length from the snout to the root of the caudal	7	4
Height of the body	2	5
Length of the head	2	3
Diameter of the eye	0	$7\frac{1}{2}$
Length of the fourth dorsal spine	0	10
——— of the seventh dorsal ray	1	$1\frac{1}{2}$
——— of the upper caudal lobe	2	7
——— of the third anal spine	0	9
——— of the first anal ray	1	0
——— of the pectoral fin	1	8
——— of the ventral fin	1	6
——— of a large scale	0	$2\frac{3}{4}$
Height of a large scale	0	$3\frac{3}{4}$

11. Scolopsis temporalis.

Scolopsides temporalis, *Cuv. & Val.* v. p. 341.

D. $\frac{10}{8-9}$. A. $\frac{3}{7}$. L. lat. 47. L. transv. 6/17.

The snout is as long as the diameter of the eye; the præorbital two-thirds as high as the eye, with a flat spine and some denticulations beneath; the præoperculum with the posterior limb oblique and coarsely denticulated, and with the angle projecting backwards. The spines of the fins rather slender; the second anal spine shorter and not thicker than the third. Caudalis deeply forked, with the lobes produced into filaments, the upper being the longest. The first ray of the ventrals produced into a short filament. Upper part of the head, between the scaly crown and the tip of the snout, violet, with three cross-bands of yellowish colour (in a dried state); the upper band continued behind the eye, and forming there a violet ring with yellowish centre. Body and fins uniform.

Seas of Waigiou, Vanicolo, and New Guinea; Louisiade Archipelago.

a, b. Adult: stuffed. Louisiade Archipelago (in 15 fathoms). Voyage of the Rattlesnake.

12. Scolopsis personatus.

Cuv. & Val. v. p. 344; *Bleek. Sumatra,* i. p. 575.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 50.

The height of the body is $3\frac{3}{4}$ in the total length, the length of the head four times; the diameter of the eye is $3\frac{1}{3}$ in the latter. The præorbital is half as wide as the eye, and denticulated beneath the spine: the snout is scarcely longer than the diameter of the eye. Præoperculum with the angle rounded, and the posterior limb slightly emarginate, strongly denticulated. The third anal spine longest.

Caudal fin deeply forked, with the lobes pointed; the first ray of the ventral fins produced into a short filament. Snout above violet, with a bluish band (in life) between the eyes; a broad yellow band from the eye to the caudal; the soft dorsal with a violet margin behind.

Seas of Java and Sumatra.

13. Scolopsis frenatus.

Cuv. & Val. v. p. 343.

D. $\frac{10}{9}$. A. $\frac{3}{7}$.

Præoperculum with strong denticulations, some of which are bifurcate; the angle projecting backwards. Caudalis deeply forked, with both the lobes produced into filaments. The upper part of the muzzle violet, with a whitish margin in front; a green band from the eye to the third dorsal spine (sometimes disappearing in spirits). Sometimes a blackish spot on the tail. (*Cuv.*)

Seychelles; Isle de France.

14. Scolopsis cancellatus.

? Scolopsis lineatus, *Quoy & Gaim. Voy. de l'Astrol.* pl. 60. f. 3 (very bad).

Scolopsides cancellatus, *Cuv. & Val.* v. p. 351; *Bleek. Verh. Batav. Genootsch.* xxiii. *Sciæn.* p. 28.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 42. L. transv. 3/12.
Cæc. pylor. 6. Vert. 10/14.

The height of the body is nearly equal to the length of the head, and $3\frac{2}{3}$ in the total; the snout is very short, two-thirds of the diameter of the eye, which is $2\frac{1}{2}$ in the length of the head. The interspace between the eyes is flat, narrowest above the middle of the eyes, and there shorter than the width of the eye; but above the anterior angle of the orbit it widens so much as to equal the diameter mentioned. The upper maxillary extends to the vertical from the front margin of the orbit. The infraorbital arch with one spine only. Præoperculum finely and equally serrated, with a slight notch above the angle. Spines of the fins moderate; the second anal spine rather stronger, but not longer than the third. Back largely marbled with greyish brown; two yellowish longitudinal streaks from the upper half of the eye; a black spot between the first three dorsal spines.

Polynesia; Sumatra.

a. Half-grown. Sumatra. From the Collection of the Zoological Society.

15. Scolopsis bleekeri.

Scolopsides lineatus, *Bleeker, Solor*, p. 73 (not *Rüpp.*).

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 35.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the

head $4\frac{1}{4}$; the diameter of the eye is $2\frac{2}{3}$ in the latter, and longer than the snout. The præorbital is one-third as high as the eye, and armed with a strong slender spine and some denticulations beneath. Præoperculum with the posterior limb strongly serrated and scarcely emarginate. Caudalis forked; the second anal spine much longer and stronger than the third, even longer than the soft portion of the fin. Above dark violet; a yellow cross-band between the eyes; three bluish longitudinal bands—the first along the middle of the neck to the dorsal fin, the second from the crown to the base of the soft dorsal, the third from the eye to the end of the dorsal; a white longitudinal band from the snout, below the eye, to the caudal. A black spot on the anterior part of the spinous dorsal. (*Bl.*)

Sea of Solor.

16. Scolopsis ghanam.

Sciæna ghanam, *Forsk.* p. 53
Holocentrus ghanam, *Lacép.* iv. p. 347.
Scolopsis lineatus, *Rüpp. Atl. Fische*, p. 7. pl. 2. f. 1, and *N. W. Fische*, p. 126.
Scolopsides ghanam, *Cuv. & Val.* v. p. 348.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 48. L. transv. 4/14. Cæc. pylor. 3.

The height of the body is $3\frac{2}{3}$ in the total length, the length of the head four times; the diameter of the eye is $3\frac{2}{5}$ in the latter, and much longer than the snout, or the interspace between the eyes. The infraorbital arch with one flat spine of moderate length; the spiniferous plate slightly denticulated, and not elevated. Præoperculum with a notch above the angle. Spines of the fins slender; the third of the anal longer and not thinner than the second. Caudalis slightly forked. The lateral line angularly curved below the fourth dorsal spine, and steeply descending behind the end of the dorsal fin. On each side four whitish lines: the first from above the anterior angle of the orbit to the end of the dorsal; the second from the suprascapula above, and following the lateral line to the back of the tail; the third from the posterior upper angle of the orbit below, and following the lateral line, lost on the posterior third of the body; the fourth, shortest, from the posterior lower angle of the orbit, lost above the base of the pectoral.

Red Sea.

a. Adult.
b. Adult.

17. Scolopsis pectinatus.

Scolopsides pectinatus, (*Kuhl & v. Hass.*) *Cuv. & Val.* v. p. 346.

D. $\frac{10}{8}$. A. $\frac{3}{6}$.

Præorbital narrow, with a very acute spine and without other denticulations; præoperculum with the angle projecting backwards. Yellowish, indistinctly spotted; fins immaculate. (*Cuv.*)

Sea of Java.

18. Scolopsis longulus.

Richards. Ann. & Mag. Nat. Hist. ix. 1842, p. 389.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 42. L. transv. 3/15.

The height of the body is nearly equal to the length of the head, and about one-fourth of the total; the diameter of the eye is rather shorter than the snout, and $3\frac{3}{4}$ in the length of the head. The præorbital is three-quarters as wide as the eye, and armed with a small spine and some denticulations beneath; præoperculum with the posterior limb very finely serrated, and with the angle rounded. The spines of the fins moderate; the second of the anal shorter than the third. Caudalis emarginate. A yellowish band broadly edged with blackish above and below, from above the pectoral to the root of the caudal; two indistinct blackish lines above the lateral line.

North-west coast of Australia.

a. Adult: skin. Torres Straits. From Mr. Gilbert's Collection.—Type of the species.
b. Adult: skin. Port Essington. Presented by the Earl of Derby.
c. Adult: skin. Port Essington.

19. Scolopsis leucotænia.

Bleeker, Banka, p. 451.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 36.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head four times; the diameter of the eye is $2\frac{3}{4}$ in the latter, and longer than the snout. The præorbital half as high as the eye, with a single spine, and without denticulations beneath; præoperculum with the posterior limb slightly emarginate and strongly denticulated. Caudalis forked; the second anal spine much longer and stronger than the third. A brown band from above the eye to the end of the dorsal fin, a second from the snout to the base of the caudal; a white band between. (*Bl.*)

Sea of Banka.

20. Scolopsis leucotænioides.

Bleeker, Celebes, vii. p. 439.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 40.

The height of the body is equal to the length of the head, and one-fourth of the total; the diameter of the eye is much longer than the snout, twice the distance between the eyes, and $2\frac{1}{2}$ in the length of the head. The præorbital is one-third as high only as the eye, with a short spine behind, and without any other denticulations. Præoperculum serrated. Caudalis forked; the second and third anal spines nearly equal. A black curved band from the muzzle, above the eye and the lateral line, to the caudal fin, anteriorly and posteriorly united with that of the other side; a second black straight band from the muzzle, through the eye, to the root of the caudal; a third, very broad white band from the eye to the caudal. A black blotch between the first and fourth dorsal spines; a series of brownish spots along the base of the soft dorsal. (*Bl.*)

Sea of Manado (Celebes).

21. Scolopsis caninus.

Cuv. & Val. v. p. 354.

$$D. \frac{10}{9}. \quad A. \frac{3}{7}.$$

Several larger teeth in the jaws. Præorbital with the posterior margin very oblique, entire, and terminating above in a short point; præoperculum with the margin rounded and scarcely serrated; spines of the fins slender. A yellowish band from the eye to the caudal fin.

New Guinea.

14. HETEROGNATHODON*.

Heterodon, *Bleeker, Bydr. Topogr. Batav.*

Heterognathodon, *Bleeker, Natuurk. Tydschr. Nederl. Ind.* i. 1850, p. 100, and *Verhand. Batav. Genootsch.* xxiii. *Sciæn.* p. 30.

Form of the body oblong; eye moderate; cleft of the mouth nearly horizontal, with the jaws equal. One dorsal; dorsal with the number $\frac{10}{9}$; anal $\frac{3}{7}$; spines feeble. Caudalis more or less deeply forked. Canine teeth in both jaws. Infraorbital arch entire; præoperculum serrated; operculum with a single spine. Five (sometimes six) branchiostegals. Scales moderate, ciliated.

East Indian Seas.

1. Heterognathodon bifasciatus.

Bleeker, Verhand. Batav. Genootsch. xxiii. *Sciæn.* p. 30.

$$D. \frac{10}{9}. \quad A. \frac{3}{7}. \quad L. lat. 40.$$

The height of the body is one-fifth of the total length, the length of the head one-fourth. The snout is convex, shorter than the diameter of the eye, which is $2\frac{2}{3}$ in the length of the head. The upper maxillary bones rough; præorbital naked. The third anal spine longest; caudalis emarginate. Bluish, with two pearl-coloured longitudinal bands; the first between the eye and the end of the dorsal, the second from the snout to the caudal. (*Bl.*)

Sea of Sumbawa.

2. Heterognathodon hellmuthii.

Bleeker, Solor, p. 75.

$$B. 6. \quad D. \frac{10}{9}. \quad A. \frac{3}{7}. \quad L. lat. 50.$$

The height of the body is $4\frac{3}{4}$ in the total length, the length of the

head $4\frac{2}{3}$. The snout is convex, shorter than the diameter of the eye, which is nearly one-third of the length of the head. Præorbital and margin of the præoperculum scaly; the posterior limb of the præoperculum minutely denticulated. Caudalis forked. A brownish longitudinal band from the eye to the caudal fin; above and below the lateral line two series of blue dots. (*Bl.*)

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* I suppose that the *Lama gulimínda*, Russell, ii. pl. 107, is to be referred to this genus. It is identical with *Cantharus gulimínda*, Cuv. & Val. vi. p. 344, and *Spondyliosoma guliminda*, Cantor, Catal. p. 50.—East Indian Seas.

Sea of Solor.

3. Heterognathodon xanthopleura.

Heterodon zonatus, *Bleeker, Bydr. Topogr. Batav.*

Heterognathodon xanthopleura, *Bleeker, Natuurk. Tydschr. Nederl. Indie,* i. 1850, p. 101, and *Ver. Bat. Genootsch.* xxiii. *Sciæn.* p. 31.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 40.

The height of the body equals the length of the head, and is one-fourth of the total; the snout is conical and rather longer than the diameter of the eye, which is $3\frac{1}{2}$ in the length of the head. Præorbital naked; præoperculum very finely denticulated. The third anal spine longest. Caudalis emarginate. On each side two lighter longitudinal bands; a bluish band from the eye to the operculum.

Seas of Batavia and Amboyna.

a. Adult. Amboyna. Purchased of Mr. Frank.
b. Half-grown. Purchased of Mr. Brandt as *Dentex lineatus*.

4. Heterognathodon macrurus.

Bleeker, Natuurk. Tydschr. Nederl. Ind. i. 1850, p. 101, and *Verhand. Batav. Genootsch.* xxiii. *Sciæn.* p. 31.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 40.

The height of the body is $4\frac{1}{2}$ in the total length, the length of the head five times; the snout is conical, shorter than the diameter of the eye, which is one-third of the length of the head. Præorbital scaly. The third anal spine longest. Caudalis deeply forked. A broad yellowish band from the eye to the caudal fin. (*Bl.*)

Sea of Batavia.

5. Heterognathodon nemurus.

Bleeker, Celebes, iii. p. 754.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 45 (*Bleeker* 55?).

The height of the body equals the length of the head, and is $3\frac{1}{2}$ in the total length (without the caudal); the snout is conical and scarcely longer than the diameter of the eye, which is $3\frac{2}{3}$ in the length of the head. Præorbital naked, the margin of the præoperculum scaly. Caudalis forked, with the lobes produced into filaments longer than the fin; body with two broad yellow longitudinal bands on each side.

Sea of Macassar.

a. Adult. From the Haslar Collection.

6. Heterognathodon microdon.

Bleeker, Batav. p. 464.

B. 5. D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 48.

The height of the body is $4\frac{1}{3}$ in the total length, the length of the head $4\frac{2}{3}$. The snout is conical, shorter than the diameter of the eye, which is one-third of the length of the head. Præorbital scaleless; margin of præoperculum scaly. Caudalis forked. Rose-coloured; a yellow band from the snout through the eye to the caudal fin.

Seas of Batavia and Amboyna; Louisiade Archipelago.

a. Adult. Amboyna. Purchased of Mr. Frank.
b. Half-grown: stuffed. Louisiade Archipelago. Presented by the Lords of the Admiralty.

15. DENTEX*.

Dentex, sp., *Cuv. Règne Anim.*; *Cuv. & Val.* vi. p. 212.

Form of the body oblong, rather elevated; eye moderate; cleft of the mouth more or less horizontal, with the jaws nearly equal. One continuous dorsal, with the numbers varying between $\frac{10 \text{ and } 13}{10 \text{ and } 12}$; in the anal between $\frac{3}{8-9}$; caudalis more or less forked. Generally strong canines in both the jaws. Præorbital entire, broad; distance between the eye and the cleft of the mouth great; præoperculum entire, with more than three series of scales; operculum without prominent spine. Six branchiostegals. Scales moderate, ctenoid. Pseudobranchiæ. Swim-bladder with a notch posteriorly. Pyloric appendages in small number.

Mediterranean; Atlantic; Red Sea; Sunda Sea; Japanese Sea.

1. Dentex vulgaris.

Συναγρίς, Συνόδους, *Aristot.* ii. c. 13, 15, viii. c. 2, 13, ix. c. 2.
Dentex, *Colum.* viii. c. 16.
Συνόδους, *Ælian*, i. c. 46.
Synagris, *Salv.* p. 111; *Rondel.* v. c. 19. p. 150.
Sparus, no. 5, *Artedi, Genera*, p. 36.
——, no. 6, *Artedi, Synon.* p. 59.

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* 1. Labrus macrocephalus, *Lacép.* iii. p. 480. pl. 26. f. 1.—Dentex macrocephalus, *Cuv. & Val.* vi. p. 232; *Cuv. Règne Anim. Ill. Poiss.* pl. 35. f. 2.—Hab. ——?—Probably a species of *Pagrus*.

2. Dentex gobioides, (*Solander*) *Cuv. & Val.* vi. p. 234.—Otaheiti.

3. Labrus thunbergii, *Lacép.* iv. p. 467.—Dentex thunbergii, *Cuv. & Val.* vi. p. 237.—Japan.

4. Sparus cynodon, *Bloch*, taf. 278.—Cichla cynodon, *Bl. Schn.* p. 338.—Dentex cynodon, *Cuv. & Val.* vi. p. 239.—Hab. ——?

5. Dentex rivulatus, *Benn. Proc. Zool. Soc.* iii. p. 91 (not *Rüpp.*).—Trebizond.

6. —— waigiensis, *Quoy & Gaim. Voy. Freyc. Zool.* p. 302.—Appears to be some Percoid fish.

Sparus dentex, *L. Gm.* p. 1278; *Bl.* taf. 268; *Bl. Schn.* p. 271; *Lacép.* iv. p. 121; *Risso, Ichth. Nice,* p. 253; *De la Roche, Ann. Mus.* xiii. p. 317.
Duhamel, Pêches, ii. c. 2. p. 251.
Cichla dentex, *Bl. Schn.* p. 337.
Sparus cetti, *Risso, Ichth. Nice,* p. 256.
Dentex cetti, *Risso, Eur. Mérid.* iii. p. 256.
—— vulgaris, *Cuv. & Val.* vi. p. 220. pl. 153; *Flem. Brit. Anim.* p. 212; *Jen. Man.* p. 357; *Yarr. Brit. Fish.* i. p. 127; *Guichen. Explor. Algér. Poiss.* p. 51; *Webb & Berthel. Isles Canar. Poiss.* p. 36.

B. 6. D. $\frac{10-11}{12-11}$. A. $\frac{3}{8}$. L. lat. 60. L. transv. 7/16. Cæc. pylor. 5. Vert. 10/14.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $3\frac{3}{4}$; the diameter of the eye is $5\frac{1}{2}$ in the latter, and $2\frac{1}{2}$ in that of the snout. The præorbital is very large, its height being nearly twice that of the eye. There are eight series of scales between the præorbital and the angle of the præoperculum, the limb of which is also partly covered with small, irregular scales. In each of the jaws four canine teeth, the outer pair of which is much stronger than the inner one. The spines of the fins are rather slender and flexible; the fourth of the dorsal is the longest, and $2\frac{1}{2}$ in the length of the head. Caudalis forked. The third anal spine rather longer than the second, and rather shorter than the first ray; the posterior rays of the dorsal and anal fins slightly elongate. Bluish silvery, with some irregular blackish dots on the back; axil blackish.

Mediterranean; Canary Islands; Coast of England (occasional).

a. Adult: skeleton. Adriatic. Purchased of Mr. Frank.
b. Fine specimen. Dalmatia. Purchased of Dr. Heckel.
c. Half-grown. Lisbon. Presented by W. Swainson, Esq.
d, e. Young: stuffed: not good state. Lisbon. Presented by G. Hough, Esq.
f. Adult. Madeira. Presented by the Rev. R. T. Lowe.
g. Young: bad state. Old Collection.
h. Adult: bad state. Purchased of Mr. Frank.

Skeleton.—The upper maxillary bone is oblong, flat, with the posterior inferior angle forming a prominence, to which the extremity of the intermaxillary is joined; the intermaxillary tapers little, is rather broad at the base, and has the posterior processes nearly as long as the descending branches, although they do not reach backwards to the vertical from the anterior margin of the orbit. The mandibulary is moderately elongate and elevated, and has a very distinct muciferous channel with four elliptical openings. The head of the vomer is broad, slightly excavated and rounded anteriorly; the palatine bones have a nearly vertical situation. The turbinal bones are very elongate, tubuliform; the præorbital very large, quadrangular; there is a bony plate at the inner side of the infraorbital ring. The lower limb of the præoperculum is only one-half the length of the posterior; both meet at a rather obtuse angle, which, however, is rounded; long slits and openings lead into a channel along the interior ridge of the bone. The operculum is quadrangular, with a slight exterior ridge; the interoperculum rather broader than the suboperculum. The anterior portion of the frontal bones is slightly convex, porous. The occipital crest is strong, and extends on the frontal bones to above the centre of the orbit; the lateral crests also are very developed. The basal portion of the brain-capsule is slightly compressed, and the basisphenoid has a quadrangular opening before the occipital joint. The humeral arch and the pubic bones do not show any peculiarity.

There are ten abdominal and fourteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·4. Some of the anterior ribs are broad in their basal portion. The neural and hæmal spines slender, the interneurals dilated; the first interhæmal is rather feeble, but it has a very distinct anterior ridge.

2. **Dentex argyrozona.**

Cuv. & Val. vi. p. 235; *Smith, Ill. S. Afr. Fishes*, pl. 19.

D. $\frac{12}{9-10}$. A. $\frac{3}{8}$. L. lat. 60. L. transv. $\frac{7-8}{16}$. Cæc. pylor. 4.
Vert. 9/13.

The height of the body equals the length of the head, and is $3\frac{1}{2}$ in the total. The snout exceeds in length the diameter of the eye. Canines very strong. The præorbital scaleless, nearly as high as the eye; there are eight or nine rows of scales between the præorbital and the margin of the præoperculum, which is also covered with scales for its greater part; the scales above the lateral line scarcely smaller than those of the sides. The spines of the fins slender, rather flexible; the fourth of the dorsal longest, and not quite one-third of the length of the head; the second and third anal spines nearly equal. Caudalis emarginate. Red, with silvery longitudinal bands.

Cape Seas.

a. Half-grown: not good state. Cape of Good Hope. From the Haslar Collection.
b. 23″ long: stuffed. Cape Seas. From Sir A. Smith's Collection.
c. 29″ long: stuffed. Cape Seas. Purchased of Mr. Gould.
d. Adult: stuffed. Cape Seas. From Sir A. Smith's Collection.
e. Adult: skin. False Bay.
f. 29″ long: stuffed.

3. **Dentex præorbitalis.** (PLATE XXIII. fig. A.)

D. $\frac{12}{10}$. A. $\frac{3}{8}$ L. lat. 60. L. transv. 10/15.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head four times; the diameter of the eye is $2\frac{1}{2}$ in the length of the snout, and $6\frac{2}{3}$ in that of the head. Canines very strong. The præorbital regularly quadrangular, scaleless, much higher than wide; the width of the orbit is $2\frac{1}{4}$ in the height of the præorbital. There are eleven or twelve series of scales between the præorbital and the margin of the præoperculum, which is also entirely scaly. The scales on the upper surface of the head entirely cover the space between the eyes; those above the lateral line are considerably smaller than those below. The dorsal spines moderate, not flexible; the fourth is the longest, and 2½ in the length of the head; the third anal spine rather longer than the second. Caudalis emarginate. Coloration uniform (in a dried state).

Cape Seas.

a. Stuffed. Cape Seas. From Sir A. Smith's Collection.

Description of the specimen.—The greatest depth of the body is below the origin of the dorsal, where it is contained 3½ in the total length. The nape of the neck is very convex and gibbous; from thence the upper profile of the head is straight and descends in an oblique line. The head is elevated and strongly compressed, its width between the eyes being 5½ in its length, which is one-fourth of the total. The head is entirely covered with rather small scales, except the snout; on the upper side the scales extend to the level of the anterior nostril. The posterior processes of the intermaxillaries are rather longer than these bones. The præorbital is very large, elevated, quadrangular, with the posterior margin straight, descending obliquely downwards. The eye is situated high up the sides, but does not interfere with the upper profile; it is rather small, its diameter being 6⅔ in the length of the head.

The dorsal spines are of moderate strength, on one side broader and compressed; the first is two-thirds of the second, the second three-quarters of the third; the third rather shorter than the fourth, which appears to be the longest, and 2½ in the length of the head; the soft dorsal is considerably lower than the spinous. The caudal fin is slightly forked. The posterior edge of the pectoral is slightly emarginate; the fin is pointed, its length being 4½ in the total, and reaches nearly to the anal fin: the ventral is much shorter; but I cannot state its exact length, part of the fin being broken off.

The *scales* are rather small on the head, on the back, and on the breast, much larger on the sides of the body and on the back of the tail. They are minutely ciliated and higher than long. One of the largest covers the eye.

Each of the jaws is armed with a series of pointed conical *teeth*, becoming smaller posteriorly; there are four canines in front of the upper jaw, six in front of the lower, the outer of which are strong and curved. Behind these larger teeth is a narrow band of small cardiform teeth.

The present colour is a uniform greyish olive.

	inches.	lines.
Total length	20	6
Height of the body	5	9
Length of the head	5	0
Diameter of the eye	0	9
Distance between the eyes	0	11

	inches.	lines.
Length of the fourth dorsal spine	2	0
——— of the pectoral................	4	6
——— of the ventral spine	1	$10\frac{1}{2}$
——— of a scale....................	0	$7\frac{1}{2}$
Height of a scale....................	0	$9\frac{3}{4}$

4. Dentex rupestris.

Cuv. & Val. vi. p. 231; *Smith, Ill. S. Afr. Fishes,* pl. 14 (not good); *Owen, Osteolog. Catal.* i. p. 60.

D. $\frac{11}{11}$. A. $\frac{3}{8}$. L. lat. 58. L. transv. $\frac{11}{17}$.

The height of the body equals the length of the head, and is $3\frac{1}{2}$ in the total. The snout is twice as long as the diameter of the eye, which is $5\frac{1}{3}$ in the length of the head. Canines very strong. The præorbital scaleless, much higher than the eye; there are seventeen rows of scales between the præorbital and the margin of the præoperculum, which is also covered with scales for its greater part; the scales above the lateral line are much smaller than those of the sides, similar to those of the head. The spines of the fins moderate, not flexible; the fourth of the dorsal is the longest, and $3\frac{1}{3}$ in the length of the head; the second and third anal spines nearly equal. Caudalis emarginate. Coloration uniform.

Cape Seas.

a. Adult: stuffed. Cape Seas. From Sir A. Smith's Collection.

5. Dentex macrophthalmus.

Σύναγρις, Σύνοοον, *Athen.* vii. pp. 322, 327; *Oppian,* i. 170.
Synagris, *Bellon.* p. 181.
? Dentalis seu Dentex Bellonii, *Gesner,* pp. 934, 1119.
Synagris Bellonii, *Gesner,* p. 934.
Sparus macrophthalmus, *Bloch,* taf. 272; *Risso, Ichth. Nice,* p. 250.
Cichla macrophthalma, *Bl. Schn.* p. 337.
Sparus erythrostoma, *Risso, Eur. Mérid.* iii. no. 31.
Dentex macrophthalmus, *Cuv. & Val.* vi. p. 227; *Guichen. Explor Scient. Algér. Poiss.* p. 51; *Webb & Berth. l. c.* p. 37.
? Dentex maroccanus, *Cuv. & Val.* vi. p. 234.

B. 6. D. $\frac{12}{10}$. A. $\frac{3}{8}$. L. lat. 60.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $3\frac{3}{4}$; the diameter of the eye is one-third of the latter, and longer than the distance between the eyes; the præorbital is three times as long as high; præoperculum with scaly margin; four canines of moderate size in the upper jaw. Dorsal spines moderate; the second of the anal fin longer and stronger than the third. Caudalis emarginate. Uniform red.

Mediterranean.

a. Adult: stuffed: not good state.
b, *c*. Half-grown: stuffed.
d. Adult: skin. Mediterranean. From the Collection of the Zoological Society.

6. **Dentex filosus.**

Dentex filosus, *Valenc. in Webb, Iles Canar. Poiss.* p. 37; *Guichen. Explor. Scient. Algér. Poiss.* p. 52.
Dentex filamentosus, *Valenc. l. c.* pl. 6 (not *Cuv. & Val.*).

D. $\frac{12}{10}$. A. $\frac{3}{8}$. L. lat. 60. L. transv. 8/14.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head four times. Nape very convex, elevated. The scales of the upper surface of the skull do not extend to the vertical from the anterior margin of the eye; there are eight series of scales between the præorbital and the angle of the præoperculum. Four canines in each jaw. The third or the third and fourth spines of the dorsal produced into more or less long filaments. Caudalis forked. The first ray of the ventrals sometimes elongate. Reddish, with irregular blackish spots on the back.

Coast of Algiers; Canary Islands; Cape Seas.

a. Adult: stuffed. Cape Seas. Presented by Sir A. Smith.

7. **Dentex nufar.**

Dentex nufar, (*Ehrenb.*) *Cuv. & Val.* vi. p. 240; *Rüpp. N. W. Fische*, p. 115.

D. $\frac{12}{10}$. A. $\frac{3}{8}$. Cæc. pylor. 4.

The third spine of the dorsal fin three-quarters of the height of the body, the fourth and fifth shorter; four canines in each of the jaws. Coloration uniform silvery.

Red Sea.

8. **Dentex hypselosoma.**

Bleeker, Japan, p. 402, and *Verh. Bat. Gen.* xxvi. *Japan*, tab. 4. f. 2.

B. 6. D. $\frac{12}{10}$. A. $\frac{3}{8}$. L. lat. 50.

The height of the body is $2\frac{3}{4}$ in the total length, the length of the head $3\frac{4}{5}$ or 4; the diameter of the eye is one-third of the latter, and longer than the snout. The height of the præorbital two-thirds of that of the eye. Four canine teeth above, six below. The scales of the præoperculum are arranged in five series. Dorsal spines rather slender; the fourth longest, nearly one-third of the height of the body. Caudalis emarginate; the second anal spine longest. Rose-coloured; a broad yellow band between the eyes. (*Bl.*)

Sea of Japan.

9. Dentex griseus.

Dentex griseus, *Temm. & Schleg. Faun. Japon. Poiss.* p. 72. pl. 36; *Bleeker, Sumatra,* iv. p. 80, and *Verhand. Batav. Genootsch.* xxvi. *Japan,* p. 88.

Dentex lethrinoides, *Bleek. Java,* i. p. 102, and *Verh. Bat. Gen.* xxiii. *Spar.* p. 11.

Lobotes microprion, *Bleek. Natuurk. Tydschr. Nederl. Ind.* ii. p. 174 (young).

B. 6. D. $\frac{10}{10}$. A. $\frac{3}{10}$. L. lat. 50.

The height of the body is $2\frac{1}{2}$–$3\frac{1}{2}$ in the total length, the length of the head four times. The snout is rather longer than the eye; the præorbital is large, about half as high as the eye, and scaleless, like the margin of the præoperculum; there are four rows of scales between the præorbital and the angle of the præoperculum. Six canine teeth in the upper jaw. Spines of the fins moderate: the fourth of the dorsal longest, one-third of the height of the body; the third of the anal fin much longer than the second. Caudalis emarginate. Uniform rose-coloured, the dorsal and anal fins marbled with darker; young specimens with seven brownish cross-bands.

Seas of Japan, Java, and Sumatra.

a. Adult: stuffed: not good state. Japan.

10. Dentex microdon.

Bleeker, Celebes, i. p. 219.

B. 6. D. $\frac{10}{10}$. A. $\frac{3}{10}$. L. lat. 50.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $4\frac{1}{5}$; the diameter of the eye is one-third of the latter, and equal to the length of the snout. The height of the præorbital is $1\frac{1}{2}$ in the diameter of the eye; the upper maxillary does not extend to the vertical from the anterior margin of the orbit. No canine teeth. There are four series of scales between the præorbital and the margin of the præoperculum. Dorsal spines slender; the third, fourth, and fifth longest, one-third of the height of the body; the third anal spine longest. Caudalis deeply forked. Greenish; a black streak from the eye to the interoperculum. (*Bl.*)

Sea of Bulucomba (Celebes).

11. Dentex rivulatus.

Rüpp. N. W. Fische, p. 116. taf. 29. f. 2 (not *Benn.*).

D. $\frac{10}{9}$. A. $\frac{3}{10}$.

The height of the body is three times in the total length, the length of the head $3\frac{1}{2}$; the eye is one-third of the latter. There are four series of scales on the præoperculum. Canines in both jaws; on the sides a series of conical teeth. Spines of the fins moderate; caudalis forked; the third anal spine longest. Greenish; sides of the head with blue waved lines. (*Rüpp.*)

Red Sea.

12. Dentex multidens.

Cuv. & Val. vi. p. 238.

D. $\frac{10}{11}$. A. $\frac{3}{9}$.

Eight or ten canine-like teeth in the outer series of each of the jaws. The last rays of the dorsal and anal fins elongate; the spine of the ventral compressed, very broad, and nearly as long as the rays. Præorbital narrow and elongate. Pectoral very long. Uniform red. (*Val.*)

Red Sea.

This species, imperfectly described by Valenciennes, perhaps should be referred to *Pentapus*.

13. Dentex hasta.

Cuv. & Val. vi. p. 255.

B. 6. D. $\frac{11}{11}$. A. $\frac{3}{8}$.

Dorsal spines, and especially those of the anal, strong; præoperculum slightly ciliated, its limb scaleless. Six stout canine teeth in each of the jaws. The height of the body one-third of the total length. Coloration uniform. (*Val.*)

Coast of Malabar.

16. SYNAGRIS*.

Dentex, sp., *Cuv. Règne Anim.*; *Cuv. & Val.* vi. p. 212.

Form of the body rather elongate; eye moderate; cleft of the mouth more or less horizontal, with the jaws nearly equal. One continuous dorsal with the number $\frac{10}{9}$; anal fin $\frac{3}{7\,(8)}$; spines feeble. Caudalis deeply forked. Canine teeth, at least in the upper jaw. Infraorbital arch entire; præoperculum entire, or with very indistinct serrature, with three series of scales; operculum without prominent spine. Six branchiostegals. Scales moderate, ciliated. Pseudobranchiæ. Swim-bladder with a notch posteriorly. Pyloric appendages in small number.

From the Red Sea, through all the East Indian Seas, into the Pacific. [One species from the Surinam coast.]

1. Synagris furcosus.

Dentex furcosus, *Cuv. & Val.* vi. p. 244.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 48–50. L. transv. 4/14.

The height of the body equals the length of the head, and is one-fourth of the total; the diameter of the eye is $3\frac{2}{3}$ in the latter, and $1\frac{1}{3}$–$1\frac{1}{2}$ in the length of the snout. The præorbital is higher than the eye; there are three rows of scales between the præorbital and the margin of the præoperculum. Six canine teeth in each of the jaws. The spines of the fins slender, flexible; the fourth, fifth, and sixth of the dorsal fin longest, $2\frac{2}{3}$–$2\frac{1}{3}$ in the length of the head. Caudalis deeply forked, scaly, the upper lobe rather longer; the second and third anal spines very feeble, nearly equal; the posterior rays of the dorsal and anal fins slightly elongate. Coloration uniform.

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* 1. Dentex marginatus, *Cuv. & Val.* vi. p. 245.—East Indies.
2. —— tambuloides, *Bleek. Batav.* p. 465.—Batavia.
3. —— tolu, *Cuv. & Val.* vi. p. 249; *Bleek. Verh. Bat. Gen.* xxiii. *Spar.* p. 13.—Batavia.
4. Coryphæna striata, *Bloch.*—Dentex striatus, *Cuv. & Val.* vi. p. 252.—Tranquebar.
5. Dentex mesoprion, *Bleek. Sumatra*, ii. p. 13.—Sumatra.
6. —— ruber, *Cuv. & Val.* vi. p. 245; *Less. Voy. Coq. Zool. Poiss.* p. 187. pl. 31. f. 2; *Bleek. Verh. Bat. Gen.* xxiii. *Spar.* p. 12.—East Indies.

Coast of Trincomalee; Sea of Amboyna; Louisiade Archipelago; Coasts of Australia.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.
b. Adult: stuffed. Louisiade Archipelago. Presented by the Lords of the Admiralty.
c. Adult: stuffed. Chaumont Island (Louisiade Archipelago), in 17 fathoms. Voyage of the Rattlesnake.
d, *e*. Adult: skins. Damlay Island.
f. Fine specimen. Australia. Presented by J. Macgillivray, Esq.
g. Fine specimen. Australia. Presented by J. Macgillivray, Esq.

2. Synagris tæniopterus.

Dentex tæniopterus, *Cuv. & Val.* vi. p. 246; *Bleek. Verh. Batav. Genootsch.* xxiii. *Spar.* p. 11.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 48. L. transv. 4/11.

The height of the body nearly equals the length of the head, and is $3\frac{2}{3}$ in the total; the snout is longer than the diameter of the eye, which is one-fourth of the length of the head. The præorbital is as high as the eye; there are three series of scales between the præorbital and the margin of the præoperculum. The spines of the fins slender and flexible; the posterior of the dorsal fin longest, $2\frac{3}{4}$ in the length of the head, and rather shorter than the rays. Caudalis forked. The third anal spine intermediate in length between the second spine and the first ray; the posterior rays of the dorsal and anal fins slightly elongate. Rose-coloured, with yellow longitudinal bands on the body; a yellow band from the base of the first dorsal spine to the top of the last ray.

Coasts of Australia; Molucca Sea

a. Adult: stuffed. N.E. coast of Australia. Voyage of the Rattlesnake.
b. Adult. Molucca Sea.

3. Synagris mulloides.

Dentex mulloides, *Bleeker, Sumatra*, i. p. 576.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 50.

The height of the body is five times in the total length, the length of the head $4\frac{1}{2}$; the diameter of the eye is about one-third of the latter, and as long as the snout; the præorbital is only half the height of the eye. Six or eight canine teeth in the upper jaw, none in the lower. There are three series of scales between the præorbital and the angle of the præoperculum. The spines of the fins feeble, flexible; the middle ones of the dorsal fin highest, not quite so high as the body; the third anal spine longest, but rather shorter than the first ray. Caudalis deeply forked, the upper lobe longer Uniform rose-coloured. (*Bl.*)

Sea of Sibogha (Sumatra).

4. Synagris upeneoides.

Dentex upeneoides, *Bleeker, Banka,* ii. p. 725.

B. 6. D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 50.

The height of the body is $4\frac{1}{2}$ in the total length, the length of the head $4\frac{1}{5}$; the diameter of the eye is one-third of the latter, and as long as the snout. The upper maxillary reaches to the vertical from the anterior margin of the orbit; the height of the præorbital is $1\frac{2}{5}$ in the diameter of the eye; there are three series of scales between the præorbital and the margin of the præoperculum. Six canine teeth in the upper jaw, none in the lower. The spines of the fins slender, flexible; the middle ones of the dorsal longest, half the height of the body; the soft portion of the fin lower than the spinous. Caudalis deeply forked. Rose-coloured; the soft dorsal with a yellow longitudinal band near the upper margin. (*Bl.*)

Sea of Banka.

5. Synagris zysron.

Dentex zysron, *Bleeker, Nias,* p. 219.

B. 6. D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 50.

The height of the body is five times in the total length, the length of the head $4\frac{3}{5}$; the snout is shorter than the diameter of the eye, which is one-third of the length of the head; the præorbital is not half as high as the eye. Eight or ten canine teeth in the upper jaw. There are three series of scales between the præorbital and the margin of the præoperculum. Præoperculum with slight denticulations. Spines of the fins slender, those of the dorsal more than one-half lower than the body. Caudalis deeply forked. The third anal spine intermediate between the second spine and the first ray. Rose-coloured; dorsalis with the upper margin yellow; analis with an oblique yellowish longitudinal band. (*Bl.*)

Sea of Nias.

6. Synagris ovenii.

Dentex ovenii, *Bleeker, Celebes,* v. p. 246.

B. 6. D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 50.

The height of the body is five times in the total length, the length of the head $4\frac{1}{5}$; the diameter of the eye is one-third of the latter, and equal to the length of the snout; the height of the præorbital is

$1\frac{3}{5}$ in the diameter of the eye. Six or eight canine teeth in each jaw. Scales of the præoperculum arranged in three series. Dorsal spines slender, about half the height of the body; caudal fin deeply forked, with the upper lobe longer. The third anal spine longest, much shorter than the soft portion of the fin; the posterior anal ray shortest. Rose-coloured, without any bands. (*Bl.*)

Sea of Macassar.

7. **Synagris metopias.**

Dentex metopias, *Bleek. Act. Soc. Nederl.* ii., *Amboina*, p. 51.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 48–50.

The height of the body is $4\frac{2}{5}$ in the total length (without caudal fin), the length of the head $3\frac{3}{5}$; the diameter of the eye is $2\frac{2}{3}$ in the latter, and much longer than the snout; the height of the præorbital is less than one-half the width of the orbit (above the angle of the mouth); the upper maxillary reaches to below the anterior half of the eye; præoperculum with denticulations. The soft portion of the dorsal scarcely higher than the spinous; the first ventral ray produced into a filament; the upper caudal lobe longer than the lower. Uniform rose-coloured. (*Bl.*)

Sea of Amboyna.

8. **Synagris hexodon.**

Dentex hexodon, *Quoy & Gaim. Voy. Freyc. Poiss.* p. 301; *Cuv. & Val.* vi. p. 243.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 45.

Scales of the cheeks larger than those of the body; six canines in each jaw; the dorsal spines feeble, and lower than the soft portion of the fin. Body elongate. Uniform rose-coloured, silvery beneath. (*Val.*)

A rather doubtful species, from the Sea of Timor.

9. **Synagris peronii.**

Dentex peronii, *Cuv. & Val.* vi. p. 245. pl. 154.

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 65.

The height of the body equals the length of the head, and is $4\frac{1}{4}$ in the total length. Caudalis deeply forked, covered with scales. The posterior rays of the dorsal and anal fins not elongate; the third anal spine longer than the second. Rose-coloured. (*Val.*)

Molucca Sea.

10. **Synagris variabilis.**

Dentex variabilis, (*Ehrenberg*) *Cuv. & Val.* vi. p. 241.
—— fasciolatus, (*Ehrenberg*) *Cuv. & Val.* vi. p. 242.

D. $\frac{10}{9}$. A. $\frac{3}{8}$.

Dorsal fin rather low. Silvery; body and vertical fins marbled with brownish. (*Val.*)

Red Sea.

11. Synagris luteus.

? Coryphæna lutea, *Bl. Schn.* p. 297. taf. 58.
Dentex luteus, *Cuv. & Val.* vi. p. 250.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 40.

Teeth nearly equal. (*Val.*)
Coast of Pondicherry.

12. Synagris celebicus.

Dentex celebicus, *Bleeker, Celebes,* v. p. 245.

B. 6. D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 50.

The height of the body is five times in the total length, the length of the head $4\frac{1}{4}$. The snout is scarcely shorter than the diameter of the eye, which is one-third of the length of the head; the upper maxillary reaches to below the anterior half of the eye; the præorbital is narrow, its height being $1\frac{2}{3}$ in the diameter of the eye. Six canine teeth in each jaw. Scales of the præoperculum arranged in three series. The dorsal spines slender, the posterior ones longest, one-half the height of the body; the soft portion of the dorsal scarcely higher than the spinous. Caudalis deeply forked; the third anal spine longest, rather shorter than the soft portion of the fin. Rose-coloured, with a yellow lateral band; dorsal and anal fins with two greenish-yellow longitudinal bands, the former with a yellow margin.

Macassar; Louisiade Archipelago.

a. Adult: stuffed. Louisiade Archipelago (in 30 fathoms). Voyage of the Rattlesnake.

13. Synagris nematopus.

Dentex nematopus, *Bleeker, Celebes,* i. p. 219.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 45.

The height of the body is $4\frac{1}{2}$ in the total length, and equals the length of the head; the diameter of the eye is $3\frac{1}{3}$ in the latter, and equal to the length of the snout. The præorbital is half as high as the eye; there are three series of scales between the præorbital and the margin of the præoperculum. The upper maxillary reaches beyond the vertical from the anterior margin of the eye. Four canines in the upper jaw, none in the lower. Spines of the fins slender; the posterior ones of the dorsal longer, and $1\frac{3}{4}$ in the height of the body; the soft portion of the fin higher than the spinous. The pectoral fins rather longer than the head; in adult specimens the first ray of the ventrals produced into a filament, reaching beyond the origin of the anal fin. The third anal spine intermediate in length between the second spine and the first ray. Caudalis deeply forked, the upper lobe being longer. Red, with two yellow bands from the head to the caudal fin; dorsal fin with three waved, greenish-yellow longitudinal stripes.

Sea of Bulucomba (Celebes). Louisiade Archipelago.

a–d. Adult and half-grown: stuffed. Louisiade Archipelago. Voyage of the Rattlesnake (in 30 fathoms).

14. Synagris japonicus.

Sparus japonicus, *Bloch*, t. 277. f. 1.
Dentex blochii, *Bleeker, Natuurk. Tydschr. Nederl. Indie*, 1851, p. 176.

B. 6. D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 45.

The height of the body is 4 or $3\frac{3}{4}$ in the total length, and nearly equal to the length of the head; the diameter of the eye is $3-3\frac{1}{2}$ in the latter, and rather longer than the snout; the height of the præorbital is about one-half of the diameter of the eye; there are three series of scales between the præorbital and the angle of the præoperculum. Eight or ten canine teeth in the upper jaw, none in the lower. The spines of the fins slender; the posterior ones of the dorsal longer, $2\frac{2}{3}$ in the height of the body; the third anal spine intermediate in length between the second spine and the first ray. Caudalis deeply forked, with the upper lobe longer, and sometimes produced into a short filament. Reddish violet, with seven or eight golden longitudinal bands; a ferruginous spot on the operculum; dorsal fin yellow-edged, caudal red. (*Bl.*)

Sea of Batavia.

15. Synagris filamentosus.

Cantharus filamentosus, *Rüpp. Atl. Fische*, p. 50. pl. 12. f. 3 (not Dentex filamentosus, *Cuv. & Val.*).
Dentex bipunctatus, (*Ehrenberg*) *Cuv. & Val.* vi. p. 247.
—— tambulus, *Cuv. & Val.* vi. pp. 249, 558 (not Sparus japonicus, *Bloch*); *Rüpp. N. W. Fische*, p. 114; *Bleek. Verhand. Bat. Genootsch.* xxiii. *Spar.* p. 12.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. Cæc. pylor. 4.

The height of the body is three times in the total length (without caudal), the length of the head $3\frac{1}{4}$. The snout is longer than the eye. The posterior spines of the dorsal fin longest, one-third of the height of the body; caudalis deeply forked; in adult specimens (males?) the upper lobe prolonged into a filament nearly as long as the fin, and the ventrals elongate, about one-fourth of the total length. Reddish; two yellow streaks along the belly.

Red Sea; Coast of Pondicherry.

16. Synagris nemurus.

Dentex nemurus, *Bleek. Act. Soc. Nederl.* ii., *Amboina*, p. 49.

B. 6. D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 50.

The height of the body is $4\frac{1}{4}$ in the total length (without caudal fin), the length of the head $3\frac{3}{5}$; the diameter of the eye is $2\frac{2}{3}$ in the latter, and longer than the snout; the præorbital is not half as high as the orbit (above the angle of the mouth); the upper maxillary bone reaches to below the anterior half of the orbit; præoperculum denticulated, operculum with a conspicuous spine. The first ventral ray produced into a filament; the upper caudal lobe with a filament, which is $3\frac{2}{5}$ in the length of the body. Rose-coloured; the dorsal fin with a yellow margin; the anal with a series of yellow dots along the base. (*Bl.*)

Sea of Amboyna.

17. **Synagris sinensis.**

Sparus sinensis, *Lacép.* iv. p. 46.
Dentex setigerus, *Cuv. & Val.* vi. p. 253; *Faun. Japon. Poiss.* p. 73. pl. 37. f. 1 (not good).

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 48. L. transv. 4/10.

The height of the body is four times in the total length (*without caudal*), the length of the head $3\frac{3}{4}$; the diameter of the eye is much shorter than the muzzle, and one-fourth of the length of the head. Præorbital very large, much higher than the eye, and scaleless, like the margin of the præoperculum. Præoperculum minutely ciliated. The spines of the fins slender, those of the dorsal $2\frac{1}{2}$ in the length of the head; the last rays of the dorsal and anal fins elongate; the upper lobe of the caudal produced into a very long filament. Red, with six yellow longitudinal bands on each side; dorsal and anal fins with a yellow band along the base and margin; the elongated caudal ray yellow.

Japanese and Chinese Seas.

a. Adult: stuffed: injured. China. Presented by J. R. Reeves, Esq.
b. Adult: skin: not good state. China. Presented by J. R. Reeves, Esq.

18. **Synagris nematophorus.**

Dentex nematophorus, *Bleeker, Sumatra,* iii. p. 500.

B. 6. D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 48.

The height of the body is nearly equal to the length of the head, and $4\frac{1}{3}$ in the total; the diameter of the eye is about one-third of the latter, and longer than the snout. The præorbital is half the height of the eye; there are three series of scales between the præorbital and the angle of the præoperculum; the upper maxillary reaches to the vertical from the anterior margin of the eye. The first two dorsal spines produced into very long filaments, extending to the caudal fin. Caudalis deeply forked, the upper lobe produced into a filament. Rose-coloured, with three or four yellow longitudinal bands; dorsal fin yellow-edged, anal with a yellow basal streak. (*Bl.*)

Sea of Padang (Sumatra).

19. Synagris macronemus.

Dentex filamentosus, *Cuv. & Val.* vi. p. 254. pl. 155 (not Dentex filamentosus, *Val. in Webb, l. c.*, or Cantharus filamentosus, *Rüpp.*).

B. 6. D. $\frac{10}{9}$. A. $\frac{3}{7}$.

The height of the body is $3\frac{3}{4}$ in the total length, the length of the head four times; the first dorsal spine, the upper lobe of the caudal, and the first ray of the ventral produced into long filaments. (*Val.*)

Surinam.

It is not certain, from the imperfect description of Valenciennes, whether this fish should be referred to *Synagris* or to *Dentex*; according to the figure, it has the habit of *Synagris*, but the scales on the præoperculum are arranged in more than three series, as in *Dentex*.

17. PRISTIPOMOIDES.

Pristipomoides, *Bleek. Natuurk. Tydschr. Nederl. Ind.* 1852, iii. p. 574.

Form of the body compressed, rather elongate; eye and muzzle moderate, with the lower jaw longest. Seven branchiostegals. Two or four canine teeth. Præoperculum denticulated. No pores under the mandibula. One dorsal with ten, the anal with three spines; caudal fin deeply forked and entirely scaly. Scales moderate, ctenoid.

Coast of Sumatra.

1. Pristipomoides typus.

Pristipomoides typus, *Bleek. l. c.* p. 575.
Dentex pristipoma, *Bleeker, Celebes,* v. p. 246.

D. $\frac{10}{10}$. A. $\frac{3}{7}$. L. lat. 50.

The height of the body is $4\frac{1}{2}$ to $4\frac{2}{3}$ in the total length, the length of the head $4\frac{1}{4}$; the snout is not shorter than the eye; the upper maxillary reaches to below the anterior half of the orbit; dorsal fin not notched, spines slender; the last ray of the dorsal and anal fins elongate. Rose-coloured. (*Bl.*)

Sea of Sibogha (West Sumatra).

18. PENTAPUS*.

Pentapus, *Cuv. Règne Anim.*; *Cuv. & Val.* vi. p. 258.
Leiopsis, *Bennett, in Life of Raffles,* p. 688.

Form of the body oblong; eye moderate; cleft of the mouth horizontal, with the jaws equal. One continuous dorsal, with the numbers varying between $\frac{10}{8 \text{ and } 10}$; in the anal between $\frac{3}{7 \text{ and } 10}$; caudalis deeply forked. Canines small. Præorbital entire, narrow; the distance between the eye and the cleft of the mouth small. Præoperculum entire, with more than three series of scales; operculum with one feeble spine. Six branchiostegals. Scales moderate, ciliated. Pseudobranchiæ. Swim-bladder simple. Pyloric appendages in small number.

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* 1. Pentapus iris, *Cuv. & Val.* vi. p. 266.—Australia.

East Indian and Australian Seas.

1. Pentapus aurolineatus.

Sparus aurolineatus, *Lacép.* iv. p. 132.

Pentapus aurolineatus, *Cuv. & Val.* vi. pp. 269, 559. pl. 157; *Bleeker, Halmaheira*, p. 7.

D. $\frac{10}{10}$. A. $\frac{3}{9-10}$. L. lat. 70–75. L. transv. 6/17.

The upper maxillary with a crenulated longitudinal ridge; four or five series of scales between the præorbital and the angle of the præoperculum. The third anal spine longest. Body with more or less distinct longitudinal stripes; a white spot on the back, beneath the end of the dorsal fin.

Isle de France; Molucca Sea; Louisiade Archipelago.

a–c. Adult: stuffed. Louisiade Archipelago (in 43 to 50 fathoms). Voyage of the Rattlesnake.

d. Adult. Isle de France. From the Collection of the Zoological Society (*Dentex lycogenis*, Benn.).

2. Pentapus vitta.

Quoy & Gaim. Voy. Freyc. Uran. Poiss. p. 294. pl. 44. f. 4; *Cuv. & Val.* vi. p. 264.

D. $\frac{10}{9}$. A. $\frac{3}{7-8}$. L. lat. 60. L. transv. 6/20.

The margin of the præoperculum without distinct scales, slightly striated. The height of the body equals the length of the head, and is about one-fourth of the total. The diameter of the eye is shorter than the snout, and the distance between the eyes one-fourth of the length of the head. Caudalis forked, with acute lobes. The spines of the fins feeble; scales of the præoperculum small, in about six series; the second of the anal one-half of the third. A broad brownish-black band from the snout through the eye to the upper half of the root of the caudal fin.

Coasts of Australia.

a, b. Adult: stuffed. Victoria (Australia). Voyage of H.M.S. Herald.

c–f. Adult: skins. Houtman's Abrolhos. From Mr. Gould's Collection.

g. Adult: not good state. From the Haslar Collection.

3. Pentapus peronii.

Cuv. & Val. vi. p. 268.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 50. Cæc. pylor. 6.

The margin of the præoperculum scaleless; pectoral very short; a black band from the eye to the caudal fin. (*Val.*)

Hab. ——?

4. Pentapus vittatus.

Sparus vittatus, *Bloch*, taf. 275.
Pentapus vittatus, *Cuv. & Val.* vi. p. 260.

B. 6. D. $\frac{10}{8}$. A. $\frac{3}{7}$. L. lat. 32. L. transv. 14–15.

The margin of the præoperculum scaly. The height of the body equals the length of the head, and is one-fourth of the total; the diameter of the eye is rather less than one-third of the length of the head, and equals that of the snout. Caudalis forked. Three blue longitudinal bands from the head along the sides. (*Val.*)

East Indies.

5. Pentapus porosus.

Cuv. & Val. vi. p. 267. pl. 156.

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 50.

The height of the body equals the length of the head, and is one-fourth of the total. The pectoral does not extend to the anal. Body with indistinct oblique streaks. (*Val.*)

Hab. —— ?

6. Pentapus nubilus.

Pentapodus nubilus, *Cantor, Catal.* p. 49.

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 47.

The length of the head, when the muzzle is protracted, is one-third of that of the body, the caudal not included. The pectoral reaches to the anal. An indistinct blackish oblique band from the nape of the neck to the point of the operculum; a second, similar, in front of the dorsal, terminating beneath the lateral line in a large rounded spot; a few indistinct, blackish, clouded spots along the sides. (*Cant.*)

Sea of Pinang.

7. Pentapus unicolor.

Cuv. & Val. vi. p. 263.

D. $\frac{10}{8}$. A. $\frac{3}{7}$. L. lat. 60.

The height of the body equals the length of the head, and is about one-fourth of the total. Caudalis forked. Coloration uniform. (*Val.*)

East Indies?

8. Pentapus setosus.

Cuv. & Val. vi. p. 270; *Bleeker, Natuurk. Tydschr. Nederl. Ind.* 1851, p. 175.

B. 6. D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 60. Cæc. pylor. 5. Vert. 10/13.

The height of the body equals the length of the head, and is $4\frac{3}{4}$ in the total; the diameter of the eye is $3\frac{1}{2}$ in the length of the head. The middle spines of the dorsal longest; the first ray of the ventrals produced into a filament, reaching to the anal; the third anal spine intermediate between the second spine and the first ray. The upper lobe of the caudal produced into a long filament. A blue and yellow band from the muzzle through the eye to the operculum; a brown, bluish-edged spot at the root of the caudal; dorsal fin with the upper margin yellow.

Sea of Batavia.

9. **Pentapus paradiseus.** (Plate XXIV. fig. A.)

D. $\frac{10}{9}$. A. $\frac{3}{7}$. L. lat. 45. L. transv. 5/16.

The height of the body equals the length of the head, and is one-fourth of the total (without caudal filament); the diameter of the eye is 3¾ in the length of the head. The middle spines of the dorsal are the longest. The first ray of the ventral sometimes produced into a short filament, which does not reach to the vent; the third anal spine intermediate between the second spine and the first ray. In male (?) individuals the upper lobe of the caudal produced into a filament, sometimes as long as the body. Muzzle above bluish silvery with two yellow cross-bands, the anterior of which runs to the middle of the eye, crossing the præorbital. A third yellow band from the præorbital, along the inferior margin of the orbit, across the cheek, operculum and suboperculum, to the base of the pectoral. A silvery longitudinal band from the middle of the eye, along the side of the body, below the lateral line, to the upper part of the tail, and convergent with another pearl-coloured band from the origin of the anal: both the latter bands meet at an acute angle in the middle of the base of the caudal fin. Finally, a pearl-coloured band on the back, along the base of the dorsal fin.

Polynesia; Sumatra.

a. 11″ long, filament 3½″. Old Collection.
b. 6″ long, filament 2″. Sumatra. From the Collection of the Zoological Society.
c, d. 7½″ long, filament 2½″. Australia. Presented by J. Macgillivray, Esq.
e, f. 8″ long, filament 5″: stuffed. Moreton Island (12 fathoms). Voyage of the Rattlesnake.
g, h. 6″ long, filament ½″: stuffed. Louisiade Archipelago (30 fathoms). Voyage of the Rattlesnake.
i. 7½″ long, filament none. Purchased of Mr. Gosse.
k. 7″ long, filament 2″. Presented by J. B. Jukes, Esq.
l. 5″ 4‴ long, filament none. From the Haslar Collection.

Description.—This fish forms one of the most beautiful species of the whole family. The coloration, with the exception of the ground-colour, is very well preserved in specimens in spirits, but not so well in dried specimens; this facilitates its distinction from *P. setosus*, to which it is closely allied. It appears, however, from the descriptions of the latter species, that, besides the differences in colour, our new species has fewer transverse rows of scales and a more elevated body. Its greatest depth is above the base of the ventral fins, where it equals the length of the head, and forms one-fourth of the total; the height of the body is $3\frac{1}{5}$ in the total length (the caudal excluded). The head is rather broad above, the distance between the eyes being more than the width of the orbit, and equal to the length of the snout; it is scaly to the level of the nostrils, which, close together, and at some distance from the eye, are situated rather on the upper surface of the head than on its side. The snout is somewhat pointed, with the jaws equal, and with the cleft of the mouth moderate and slightly oblique. The upper maxillary reaches to the vertical from the anterior margin of the orbit. The præorbital is porous, and has a slight notch to receive the extremity of the maxillary bone; here it is narrowest, the distance between the angle of the mouth and the eye being only one-half of the diameter of the latter; it is, like the rest of the snout, entirely scaleless. The præoperculum is not denticulated, exhibiting some slight striæ at the angle; the limbs have a nearly vertical direction towards each other, but the angle is rounded; there is a broad scaleless space above the angle and the lower limb, the remainder of the cheek being covered with seven series of scales of rather small size. The operculum has a semicircular notch behind, but no prominent points. The suprascapula can scarcely be distinguished from the surrounding scales.

The origin of the dorsal fin is above the posterior extremity of the operculum, and its end behind the vertical from the end of the anal fin. The spines are slender and somewhat flexible: the first is three-fifths of the length of the second; the second and third are rather shorter than the three following, which are the longest, and $2\frac{1}{2}$ in the height of the body; the posterior spine is rather shorter than the rays, which form a slightly convex margin of the fin, and none of which attain the height of the spinous dorsal; the posterior rays are not elongate. The distance between the dorsal and caudal fins equals the height of the tail below the end of the dorsal. The caudal is forked, and partly covered with series of small scales; the upper lobe is longest, and produced in some of the specimens into a filament, which is shorter than the fin in two half-grown specimens, but one-third or three-quarters of the total length in adult ones; a third part of the specimens are destitute of such a filament. I am inclined to believe that this is a sexual difference. The distance between the caudal and anal fins is equal to that between the snout and the posterior margin of the eye. The anal spines are very feeble; the first is one-half the length of the second, the second two-thirds of the third; the third is three-quarters of the first ray. The fin is lower than the soft portion of the dorsal, and has sometimes a rounded margin; sometimes the last ray is rather elongate. The pectoral is slightly pointed, and its length is $1\frac{1}{3}$ in that of the head. The base of the ventral falls behind that of the pectoral; its first ray is sometimes produced into a short filament, in other specimens not.

The scales are of moderate size, finely ciliated, much higher than long; one of the largest covers one-sixth of the eye. The lateral line follows the curvature of the back.

There are, besides the villiform bands and the outer series of larger teeth, four canines of moderate size in front of the upper jaw. The lower jaw is armed with a single pair; they are rather bent outwards, and receive the four upper ones between them.

To the coloration, as given above, must be added, that the ground-colour is now a reddish olive (rose-coloured in life?), and that two of the specimens exhibit a brownish speck at the root of the caudal, in the angle formed by the pearl-coloured bands. A similar spot is found in *Pentapus setosus*.

	inches.	lines.
Total length (without filament)	7	6
Height of the body	1	11
Length of the head	1	11
Diameter of the eye	0	6
Length of the fifth dorsal spine	0	9
——— of the pectoral	1	3
——— of a large scale	0	1½
Height of a large scale	0	3

19. CHÆTOPTERUS.

Chætopterus, *Temm. & Schleg. Faun. Japon. Poiss.* p. 78.

Form of the body elongate; eye moderate; cleft of the mouth slightly oblique, with the lower jaw rather longer. One continuous dorsal with ten spines, the anal fin with three. Caudalis deeply forked. Canine teeth none; minute teeth on the vomer and the palatine bones. Præorbital and præoperculum entire. Four branchiostegals. Scales moderate, ciliated.

Japanese Sea.

1. Chætopterus dubius.

Chætopterus, sp., *Temm. & Schleg. l. c.* pl. 37. f. 2.

D. $\frac{10}{10}$. A. $\frac{3}{8}$. L. lat. 75.

Uniform red.

Japanese Sea.

20. APHAREUS.

Aphareus, *Cuv. & Val.* vi. p. 485; *Rüpp. N. W. Fische*, p. 121.

Form of the body oblong; eye moderate; the cleft of the mouth slightly oblique, rather wide, with the lower jaw longer. One dorsal, continuous, with the anterior part highest, and with ten or twelve spines; analis $\frac{3}{8}$. All the spines feeble; caudalis deeply forked. No canines. No teeth on the palate. Præorbital and præoperculum entire. Scales rather small. Seven branchiostegals. Air-bladder simple. A (respiratory) cavity behind the branchiæ, at the interior side of the humerus. Pyloric appendages in small number.

Red Sea; Isle de France.

1. Aphareus furcatus.

Renard, pl. 30. p. 166; *Valentyn*, no. 129.
Labrus furcatus, *Lacép*. iii. pp. 424, 477. pl. 21. f. 1.
Caranxamorus sacrestinus, *Lacép*. v. p. 682.
Aphareus cærulescens, *Cuv. & Val.* vi. p. 487. pl. 167 *b*.

D. $\frac{10}{11}$. A. $\frac{3}{8}$. L. lat. 75.

The third dorsal spine is the longest. The last ray of the dorsal and anal fins twice as long as the preceding. Uniform brownish blue. (*Cuv.*)

Isle de France.

2. Aphareus rutilans.

Cuv. & Val. vi. p. 490; *Rüpp. l. c.* —; ? *Bleek. Act. Soc. Nederl.* ii., *Amboina*, p. 52.

D. $\frac{12}{9}$. A. $\frac{3}{8}$. Cæc. pylor. 5.

The fourth, fifth, and sixth dorsal spines are the longest; the last ray of the dorsal and anal fins twice as long as the preceding. Uniform rose-coloured.

Red Sea. [Sea of Amboyna.]

Bleeker found ten dorsal spines and eleven rays in a specimen from Amboyna, which number is given to the other species by Cuvier. In other respects the description agrees better with *A. rutilans*. Bleeker states seventy scales for the lateral line.

21. MÆNA*.

Mæna, *Cuv. Règne Anim.*; *Cuv. & Val.* vi. p. 386.

Form of the body compressed, oblong; eye moderate; the mouth very protractile; the posterior processes of the intermaxillaries extending to the occiput. One dorsal, scaleless, with the number $\frac{11}{11}$; the anal $\frac{3}{9}$: the spines feeble. Caudalis forked. Minute teeth on the vomer. Præoperculum entire. Scales moderate, ciliated. Six branchiostegals. Pseudobranchiæ. Air-bladder posteriorly divided into two lobes. Pyloric appendages in small number.

Mediterranean.

1. Mæna vulgaris.

? Μαινὶς, *Aristot.* vi. cap. 15, 17, viii. cap. 30, ix. cap. 2.
? Mæna, *Plin.* ix. cap. 25; *Rondel.* v. cap. 13. p. 138.
Sparus, sp. 7, *Artedi, Genera*, p. 36.
Sparus mæna, *L. Gm.* p. 1271; ? *Bl.* taf. 270; *Bl. Schn.* p. 272.
—— mendola, *Lacép*. iv. p. 85.
Mæna vulgaris, *Cuv. & Val.* vi. p. 390; *Martens, Reise nach Venedig*, ii. p. 424; *Guichen. Explor. Scient. Algér. Poiss.* p. 55.

B. 6. D. $\frac{11}{11}$. A. $\frac{3}{9}$. L. lat. 75. L. transv. 6/13. Cæc. pylor. 4. Vert. 9/13.

The height of the body is 3½ in the total length, the length of the

* 1. Mæna jusculum, *Cuv. & Val.* vi. p. 395.—Mediterranean.

head $4\frac{1}{4}$; the diameter of the eye is one-fourth of the latter. The height of the dorsal is $2\frac{1}{2}$ in that of the body. Lead-coloured, with indistinct longitudinal stripes; a black blotch beneath the lateral line.
Mediterranean.

a. Adult. Sicily. Presented by W. Swainson, Esq.
b–e. Adult and half-grown. Malta. From the Haslar Collection.
f. Adult female: not good state. Malta.
g. Adult.
h, *i*. Adult: stuffed. From Mr. Yarrell's Collection.
k. Adult: stuffed.

2. Mæna vomerina.

Cuv. & Val. vi. p. 400. pl. 164.

D. $\frac{11}{11}$. A. $\frac{3}{9}$. L. lat. 60–65. L. transv. 20. Cæc. pylor. 4.

The vomerine teeth are arranged in a small patch on the anterior part of the bone. The height of the body is $3\frac{3}{4}$ in the total, the length of the head $4\frac{1}{5}$; the diameter of the eye is one-third of the latter; the spinous dorsal half as high as the body. Coloration uniform. (*Val.*)
Malta.

3. Mæna zebra.

? Sparus lineatus, *Osbeck, Act. Nov. Nat. Curios.* iv. 1770, p. 100*
Sparus zebra, *Brünn. Pisc. Mass.* p. 47; *Bl. Schn.* p. 279.
—— osbeckii, *Lacép.* iv. pp. 33, 109; *Risso, Ichth. Nice*, p. 246.
—— massiliensis, *Lacép.* iv. p. 107.
—— tricuspidatus, *Spinola, Ann. Mus.* x. pl. 18.
—— gora, *Risso, Ichth. Nice*, 2nd edit. p. 357.
Mæna osbeckii, *Cuv. & Val.* vi. p. 397; *Guichen. l. c.*

D. $\frac{11}{11}$. A. $\frac{3}{9}$. L. lat. 70. L. transv. 20. Cæc. pylor. 4. Vert. 10/13.

The height of the body is three times in the total length, the length of the head $4\frac{1}{2}$. Greyish blue: head, body, and vertical fins with light-blue spots, those of the cheeks forming radiating series.
Mediterranean.

22. SMARIS†.

Smaris, *Cuv. Règne Anim.*; *Cuv. & Val.* vi. p. 403.

Form of the body oblong or cylindrical; eye moderate or rather large; the mouth very protractile, the posterior processes of the intermaxillaries extending to the occiput. One dorsal, scaleless, with (nine) eleven and more spines, the anal fin with three; all the spines very feeble; caudalis forked. No teeth on the vomer. Præoperculum entire. Scales rather small, ciliated. Six branchiostegals. Pseudobranchiæ. Air-bladder generally forked posteriorly. Pyloric appendages in small number.

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* It is very doubtful whether the fish described by Osbeck is to be referred to this species, which has no lateral blotch, whilst Osbeck says, "Macula nigra utrinque infra lateralem." The fish is called by Osbeck *Sp. lineatus*, and not *radiatus*, as Valenciennes erroneously copies from Bonnaterre.

† 1. Smaris martinicus, *Cuv. & Val.* vi. p. 424.—Martinique.

Mediterranean; Atlantic. [Sea of Ceylon.]

1. Smaris vulgaris.

? Σμάρις, *Arist. Hist. Anim.* viii. cap. 30.
Smaris, *Rondel.* v. cap. 14. p. 140.
Giaret, *Bellon.* i. p. 221. fig. in p. 223 & p. 222.
Mæna candida seu Smaris Rondeletii, *Gesner, Aquat.* iv. p. 522.
Smaris primus, *Johnst.* i. cap. 1. p. 55. tab. 20. f. 5.
Sparus, sp. 10, *Artedi, Genera,* p. 36.
Sparus smaris, *L. Syst. Nat.* i. p. 468; *L. Gm.* p. 1271; *Bl. Schn.* p. 273; *Risso, Ichth. Nice,* p. 238 (not *Brünn.*); *Lacép.* iv. pp. 79, 84.
Smaris smaris, *Risso, Hist. Nat.* iii. p. 345.
Sparus argenteus, macula, &c., *Brünn. Ichth. Mass.* p. 42.
Smaris vulgaris, *Cuv. & Val.* vi. p. 407; *Bonap. Faun. Ital. Pesci,* pl. . f. 1.
Smaris gagarella, *Cuv. & Val.* vi. p. 420; *Bonap. l. c.*

D. $\frac{11}{11}$. A. $\frac{3}{9}$. L. lat. 70. L. transv. 7/12. Cæc. pylor. 4. Vert. 10/13.

The height of the body equals the length of the head, and is $4\frac{1}{2}$ in the total; the snout (when closed) is rather longer than the diameter of the eye, which is $3\frac{1}{2}$ in the length of the head. The dorsal fin not notched, with the posterior rays shortest; the sixth spine is the longest, longer than one-half of the height of the body. A large black lateral spot beneath the lateral line.

Mediterranean.

a. Fine specimen. Dalmatia.
b, c. Adult. Adriatic. From Mr. Frank's Collection.
d. Adult. Lisbon.
e. Adult: skin. Mediterranean. From the Collection of the Zoological Society.

2. Smaris alcedo.

Smaris, *Willughby,* iv. cap. 23. p. 43.
Sparus alcedo, *Risso, Ichth. Nice,* p. 258.
Smaris smaris, mas, *Risso, Eur. Mérid.* iii. p. 345.
Sciæna gymnodon, *Pall. Zoogr.* iii. p. 252.
Smaris alcedo, *Cuv. & Val.* vi. p. 416; *Bonap. Faun. Ital.* pl. . f. 3; *Guich. Explor. Scient. Algér. Poiss.* p. 55.
—— chryselis, *Cuv. & Val.* vi. p. 419. pl. 165; *Bonap. l. c.* f. 4; *Nordm. in Demid. Voy. Russ. Mérid.* p. 389.

D. $\frac{11}{11}$. A. $\frac{3}{9}$. Cæc. pylor. 4.

The height of the body is nearly equal to the length of the head, and one-fourth or one-fifth of the total. The spinous dorsal rather higher than one-half of the depth of the body; the posterior rays not shortened. Head and body with irregular blue spots and streaks; vertical fins blue-spotted; a brownish spot between the first two or three dorsal spines.

Mediterranean.

a. Adult: skin. From the Collection of the Zoological Society.

3. Smaris maurii.

Bonap. Faun. Ital. Pesci, pl. . f. 3.

D. $\frac{11}{12}$. A. $\frac{3}{9}$.

The height of the body is rather shorter than the length of the head, and about one-fifth of the total. Dorsal fin without notch, with the posterior rays longest, rather higher than one-half the height of the body. No black lateral blotch. (*Bonap.*)

Mediterranean.

4. Smaris gracilis.

Sparus smaris, *De la Roche, Ann. Mus. Hist. Nat.* xiii. p. 344.
Smaris gracilis, *Bonap. Faun. Ital.* pl. . f. 1.

D. $\frac{11}{11}$. A. $\frac{3}{9}$.

The length of the head is much more than the height of the body, which is one-sixth of the total length. The dorsal without notch, much higher than one-half of the depth of the body; the posterior rays shortest. A black lateral blotch below the lateral line.

Mediterranean.

a. Adult: skin. Mediterranean. From the Collection of the Zoological Society.

5. Smaris melanurus.

Cuv. & Val. vi. p. 422.

D. $\frac{12}{15}$. A. $\frac{3}{15}$. Cæc. pylor. 7. L. lat. 66. L. transv. 8/15.

Lead-coloured, silvery shining; a large black spot at the root of the caudal fin.

Cape Verde.

a–c. Adult. From the Haslar Collection.

6. Smaris balteatus.

Cuv. & Val. vi. p. 424.

D. $\frac{15}{10}$. A. $\frac{3}{10}$.

Body cylindrical, elongate. Dorsalis deeply notched. Above reddish brown, dotted with white; a silvery band from above the eye to the caudal; beneath silvery. (*Val.*)

Ceylon.

7. Smaris insidiator.

Smaris insidiator, *Cuv. & Val.* vi. p. 414; *Bonap. Faun. Ital. Pesci,* pl. . f. 2.
? Smaris angustatus, *Solander, Cuv. & Val.* vi. p. 421.—Madeira.
? Smaris royeri, *Bowdich, Cuv. & Val.* vi. p. 421.—Madeira.

D. $\frac{13}{9}$. A. $\frac{3}{10}$. L. lat. 90. L. transv. 4/15. Cæc. pylor. 3.

Body cylindrical. The height of the body is one-sixth of the total length, the length of the head one-fourth; the diameter of the eye is nearly one-third of the length of the head, and equal to that of the snout. Caudalis notched. No lateral blotch.

Mediterranean; Madeira.

a. Fine specimen. Madeira. From the Haslar Collection.
b. Fine specimen. Madeira. Purchased of Mr. Stevens.
c. Adult: bad state. Madeira. From the Haslar Collection.
d. Adult. Bay of Naples. Presented by S. P. Pratt, Esq.
e. Adult.
f. Adult.

23. CÆSIO*.

Cæsio, sp., (*Commerson*) *Cuv. Règne Anim.*; *Cuv. & Val.* vi. p. 426.

Form of the body oblong; eye moderate; the cleft of the mouth more or less oblique, with the jaws equal, or the lower slightly longer. One dorsal, continuous, with the anterior part highest, more or less covered with scales†; the number of the spines varying between nine and thirteen; anal fin $\frac{3}{10-13}$; all the spines very feeble; caudalis deeply forked. No teeth on the palate. Præoperculum entire, or minutely denticulated. Scales moderate, ciliated. Six or seven branchiostegals. Pseudobranchiæ. Air-bladder simple. Pyloric appendages in small number.

From the Red Sea through the Indian Ocean into the Pacific.

1. Cæsio lunaris.

Renard, pl. 32. f. 174.
Cæsio lunaris, (*Ehrenbg.*) *Cuv. & Val.* vi. p. 441; *Less. Voy. Coq. Zool.* ii. p. 186, *Poiss.* pl. 34 (faulty); *Bleeker, Natuurk. Tydschr. Nederl. Indie,* 1851, p. 177.

D. $\frac{10}{14}$. A. $\frac{3}{11}$. L. lat. 55. Cæc. pylor. 5.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $4\frac{2}{3}$; the diameter of the eye is $3\frac{1}{3}$ in the latter; the second anal spine longer and stronger than the third. No lateral band; a black spot at the axil; caudal lobes with black tips.

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* 1. Cæsio tricolor, *Cuv. & Val.* vi. p. 438.—East Indies.
2. Sparus cuning, *Bl.* taf. 263. f. 1; *Lacép.* iv. p. 115.—Cichla cuning, *Bl. Schn.* p. 336.—Cæsio cuning, *Cuv. & Val.* vi. p. 444.—East Indies.

† Cfr. Cæsio gymnopterus, p. 394.

Red Sea; Sea of Batavia; New Ireland.

a. Adult: stuffed.

2. Cæsio xanthonotus.

Bleeker, Batav. p. 466.

D. $\frac{10}{15}$. A. $\frac{3}{12}$. L. lat. 60.

The height of the body is four times in the total length, the length of the head $4\frac{1}{3}$; the diameter of the eye is $3\frac{1}{3}$ in the latter, and longer than the snout. Above yellow, a blue band between the snout and eye; lateral line brown; base of the pectorals violet; no band or spot on the caudal. (*Bl.*)

Sea of Batavia.

3. Cæsio pisang.

Bleeker, Amboina, iii. p. 23.

D. $\frac{10}{14}$. A. $\frac{3}{11}$. L. lat. 60.

The height of the body is $4\frac{1}{4}$–$4\frac{2}{3}$ in the total length, the length of the head $4\frac{1}{4}$–$4\frac{1}{3}$; the diameter of the eye is one-third of the latter, and much longer than the snout. Rose-coloured; scales of the upper parts with a blue basal spot; lateral line brown; lobes of the caudal with black tips.

Seas of Amboyna and Batavia.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.
b. Adult. Amboyna. Purchased of Mr. Frank.
c. Half-grown. Amboyna. Purchased of Mr. Frank.

4. Cæsio pinjalo.

Pinjalo typus, *Bleek. Bydr. Topogr. Batav.*
Cæsio pinjalo, *Bleek. Java,* i. p. 102.

D. $\frac{11}{14}$. A. $\frac{3}{10}$. L. lat. 55.

The height of the body is 3 or $3\frac{1}{2}$ in the total length, the length of the head four times; the diameter of the eye is one-third of the latter. Coloration uniform; dorsal black-edged. (*Bl.*)

Sea of Batavia.

5. Cæsio maculatus.

Cuv. & Val. vi. p. 439.

D. $\frac{10}{15}$. A. $\frac{3}{13}$. L. lat. 65. L. transv. 7/14.

The height of the body equals the length of the head, and is one-fourth of the total. A black longitudinal stripe on each lobe of the caudal; axil black. Greenish, spotted with blue; no lateral band.

Seas of Amboyna, Vanicolo, and China (Madagascar).

a. Large specimen. Madagascar. Presented by Dr. J. E. Gray.
b. Adult. Hong Kong. Presented by J. C. Bowring, Esq.
c. Adult. Amboyna. Purchased of Mr. Frank.
d. Adult. Amboyna. From Madame Ida Pfeiffer's Collection.

6. Cæsio cærulaureus.

Cæsio cœrulaureus, *Lacép.* iii. p. 86; *Cuv. & Val.* vi. p. 434 (cfr. p. 559, and note by *Valenciennes*).
? Smaris mauritianus, *Quoy & Gaim. Voy. Freyc. Zool. Poiss.* p. 290. pl. 44. f. 3.
? Cæsio azuraureus, *Rüpp. Atl. Fische*, p. 130.
? —— cœrulaureus, var., *Cant. Catal.* p. 54.

D. $\frac{10}{15}$. A. $\frac{3}{13}$.

The height of the body is about one-fifth of the total length. Above bluish, with a golden longitudinal band along the lateral line; along each lobe of the caudal a blackish band (*Cuv.*)

Red Sea; Isle de France; Ceylonese Sea.

It is very doubtful whether the fish described by Rüppell as *Cæsio azuraureus* is to be referred to Cuvier's species. It has the formula D. $\frac{10}{13}$, A. $\frac{3}{11}$, no lateral band, and appears to be higher in comparison with its length. On the other hand, the fish from the Red Sea, described by Cuvier as a variety of *C. cœrulaureus*, p. 436, is probably identical with *Cæsio striatus* of Rüppell. From the extremely delicate structure of the fin-rays, it is very difficult to count them and to give the correct numbers, but which is the more necessary, as we do not yet know to what extent they vary in the species of this genus.

7. Cæsio striatus.

Cæsio striatus, *Rüpp. Atl. Fische*, p. 131. pl. 34. f. 1.
? Cæsio cœrulaureus, var., *Cuv. & Val.* vi. p. 436.

B. 6. D. $\frac{9}{14}$. A. $\frac{3}{12}$. L. lat. 60. L. transv. 8/13.

The height of the body is $4\frac{1}{2}$ in the total length, the length of the head $4\frac{1}{3}$; the diameter of the eye is $3\frac{1}{2}$ in the latter, and shorter than the snout. Violet, with four or five blackish longitudinal bands; along each lobe of the caudal a blackish band; above the axil a black spot.

Red Sea.

a. Fine specimen. Red Sea.

8. Cæsio chrysozona.

Cæsio chrysozona, (*Kuhl & van Hass.*) *Cuv. & Val.* vi. p. 440.

D. $\frac{10}{15}$. A. $\frac{3}{12}$. L. lat. 65. L. transv. 6/16.

The height of the body is one-fifth of the total length, the length of the head one-fourth; the diameter of the eye is one-fourth of the latter, and nearly equal in length to the snout. A broad shining golden longitudinal band from the shoulder to the caudal; axil and tips of the caudal blackish.

Molucca Sea.

a. Adult. Moluccas. Purchased of Mr. Frank.

9. Cæsio argenteus.

Bodianus argenteus, *Bloch*, vii. p. 44. taf. 231. f. 2; *Bl. Schn.* p. 332.
Cæsio argenteus, *Cuv. & Val.* vi. p. 437.

D. $\frac{10}{14}$. A. $\frac{3}{12}$.

The height of the body is about one-fifth of the total length. Uniform silvery, with a black spot above the axil.

East Indies?

10. Cæsio tile.

Cuv. & Val. vi. p. 428; *Less. Voy. Coq. Zool. Poiss.* p. 181; *Cuv. Règne Anim. Ill. Poiss.* pl. 36. f. 2.

B. 6. D. $\frac{11}{18}$. A. $\frac{3}{12}$. L. lat. 75. L. transv. 18 or 20. Cæc. pylor. 5.

The height of the body is five times in the total length, the length of the head $4\frac{1}{2}$; the diameter of the eye is about one-fourth of the latter, and $1\frac{1}{2}$ in the distance between the eyes. A blackish band from the shoulder, continued on the upper lobe of the caudal fin; the lower lobe with a longitudinal band of the same colour. Axil black. (*Cuv.*)

Archipelago of the Caroline Islands.

11. Cæsio cylindricus. (Plate XXIV. fig. B.)

B. 7. D. $\frac{13}{17}$. A. $\frac{3}{13}$. L. lat. 76. L. transv. 6/15.

Body cylindrical; its greatest depth is one-sixth of the total length. The distance between the eyes less than the diameter of the eye. The base only of the soft portions of the vertical fins scaly. Above bluish, each scale of the back with a brownish margin; a brown longitudinal band from the suprascapula, continued on the upper caudal lobe; the lower lobe with a similar band; axil deep black.

Madagascar.

a. Fine specimen. Madagascar. Presented by Dr. J. E. Gray.

Description of the specimen.—The body is elongate, cylindrical, but with the back not broad. The length of the head is $4\frac{1}{4}$ in the total; above, it is scaly to the vertical from the centre of the eye; the distance between the eyes is less than the width of the orbit, which is nearly one-fourth of the length of the head; the snout is rather longer than the diameter of the eye, and scaleless, like a crescent-shaped space behind the eye. The cleft of the mouth is slightly oblique, and of moderate width, the upper maxillary reaching to the anterior margin of the orbit. The jaws are equal, the upper moderately protractile, the processes of the intermaxillaries reaching to above the anterior third of the eye. The teeth of the jaws are very fine; a toothless ridge across the vomer. The nostrils are distant from each other; the posterior is situated above the anterior margin of the eye, at the upper surface of the skull; the anterior more on the side of the head, nearer the eye than the extremity of the snout. There are three series of scales on the præoperculum, nearly one-half of which is scaleless and finely striated; the lower limb is rather longer than the posterior, both meeting at a rounded angle. The operculum is without any spine, and the suprascapula is not serrated. The origin of the dorsal fin is in a vertical line from the base of the ventral, and its end above that of the anal. The spines are extremely feeble; the third is the longest, and one-half of the length of the head; the posterior rays decrease in length to the origin of the soft portion. The caudal fin is deeply forked, with the lobes equal, the length of which is 5½ in the total. The lower margin of the anal is slightly emarginate, and the spines are rather shorter than the first ray. The base of the ventrals is situated at some distance from that of the pectorals, but, being much shorter, they do not reach quite so far backwards as the pectorals. Their length is 8¾ in the total, that of the pectorals 5½.

The *scales* are smooth, not ciliated, scarcely higher than long, and rather small; one of the largest covers about one-eighth of the eye. The lateral line is nearly straight, but slightly bent downwards above the anal fin.

The *ground-colour* of the back and of the sides is bluish, of the belly silvery; a brown longitudinal band runs from the suprascapula along, and on the tail above, the lateral line to the caudal, on the upper lobe of which it is continued; each scale above this band has a brownish margin. There is a similar band on the lower caudal lobe. The dorsal fin is entirely blackish; the other fins are colourless, except the base of the upper three pectoral rays, which is black, like the axil.

	inches.	lines.
Total length	4	9
Height of the body	0	9½
Length of the head	1	1½
Diameter of the eye	0	3½
Length of the third dorsal spine	0	6½
——— of the caudal fin	0	10
——— of the pectoral fin	0	10
——— of the ventral fin	0	6½

Bleeker refers the following species to *Cæsio*, from which, however, it must probably be separated, having the dorsal fin entirely naked, and seven branchiostegals. There are, moreover, extremely minute teeth on the vomer; but these alone, as Bleeker justly observes, could not alter the situation of this species in the system.

12. Cæsio gymnopterus.

Bleeker, Ternate, vii. p. 372.

B. 7. D. $\frac{9}{15}$. A. $\frac{3}{12}$. L. lat. 65–70.

Dorsal fin without any scales. The height of the body is one-seventh of the total length, the length of the head about one-fourth. The upper maxillary scaleless, reaching to the anterior margin of the eye. Coloration uniform. (*Bl.*)

Sea of Ternate.

24. ERYTHRICHTHYS.

Erythrichthys, *Temm. & Schleg. Faun. Japon. Poiss.* p. 117.
Emmelichthys, *Richards. Voy. Ereb. & Terr. Fishes,* p. 47.
Boxaodon, *Gay, Hist. Chil. Zool.* ii. p. 208.
Dipterygonotus, *Bleek. Contr. Ichth. Celebes.*

Form of the body elongate; eye moderate; the mouth very protractile, the processes of the intermaxillaries extending to the occiput. Two dorsals, with several isolated spines between; all the spines feeble. Caudalis forked. No teeth in the jaws or in the palate; the lower pharyngeal bones separated from each other, and, like the upper ones, armed with cardiform teeth. Præoperculum entire. Scales rather small, ciliated. Seven or six branchiostegals. Pseudobranchiæ.

Molucca Sea; Sunda Sea; Australian Seas; Pacific.

1. Erythrichthys schlegelii.

Erythrichthys, sp., *Temm. & Schleg. Faun. Japon. Poiss.* p. 117. pl. 63. f. 1.

B. 6. D. 10 | $\frac{2}{10}$. A. $\frac{3}{10}$.

The angle of the præoperculum is a right one, not rounded. Uniform red.

Japanese Sea.

The figure of this species given in the *Fauna Japonica* does not show isolated spines between the dorsals; but it is highly probable, from its great similarity to the following species, that such exist.

2. Erythrichthys nitidus.

Emmelichthys nitidus, *Richards. l. c.* pl. 29. f. 7, 8.

B. 7. D. 9 | 3 | $\frac{1}{9\text{–}10}$. A. $\frac{3}{10}$. L. lat. 96. L. transv. 8/20.

Uniform greyish silvery. The angle of the præoperculum rounded.

West Australia; New Zealand.

a. Adult: skin New Zealand. Presented by Mr. Frederic Knap.
b. Adult: skin.

3. Erythrichthys cyanescens.

Boxaodon cyanescens, *Gay, l. c.* p. 209, *Atl. Ictiol.* lam. 5. f. 1.

D. 8 | 5 | 10. A. $\frac{2\,(3?)}{12}$.

Uniform bluish green.

Sea of Valparaiso.

This fish decidedly belongs to the genus *Erythrichthys* of Schlegel.

or *Emmelichthys* of Richardson; but it is difficult to give the distinctive characters of the species, as the description quoted evidently contains many errors: *e. g.* six branchiostegals are stated in the diagnosis of the genus, and seven in the formula attributed to the species; two anal spines are given in the description, and three in the figure, &c. The mouth also is said to be little protractile.

4. Erythrichthys leucogrammicus.

Dipterygonotus leucogrammicus, *Bleek. Contr. Ichth. Celebes.*
Emmelichthys leucogrammicus, *Bleek. Java,* i. p. 103.

B. 7. D. 10 | 4 | $\frac{1}{9}$. A. $\frac{3}{10}$.

Bluish, with three white longitudinal streaks on each side.
Sunda and Molucca Seas.

a, b. Half-grown. Amboyna. Purchased of Mr. Frank.
c, d. Half-grown: not good state. Molucca Sea. Purchased of Mr. Frank.

25. PENTAPRION.

Pentaprion, *Bleek. Java,* i. p. 104, and *Verh. Batav. Genootsch.* xxiii. *Mænid.* p. 13.

Form of the body compressed, oblong; eye moderate; mouth very protractile, and descending when thrust out. One dorsal, deeply notched, with ten spines, the anal fin with five. Caudalis forked. No teeth on the palate. Scales moderate, not ciliated, deciduous. Six branchiostegals.
Sunda Sea.

1. Pentaprion gerreoides.

Bleeker, l. c.

D. $\frac{10}{14}$. A. $\frac{5}{12}$.

Uniform silvery.
Sea of Batavia.

26. POLYCENTRUS.

Polycentrus, *Müll. & Trosch. in Schomb. Reis. Brit. Guyana,* iii. p. 622, and *Horæ Ichthyol.* iii. p. 25.

Six branchiostegals. Præoperculum and præorbital serrated; operculum spiniferous. No lateral line. Dorsal and anal fins with numerous spines. Pharyngeal bones separated from each other. Pseudobranchiæ hidden.
Essequibo.

1. Polycentrus schomburgkii.

Müll. & Trosch. l. c., and *Hor. Ichthyol.* iii. taf. 5. f. 2.

B. 6. D. $\frac{16}{8}$. A. $\frac{13}{7}$. V. 1/5.

Brown.
Essequibo.

Fam. 6. MULLIDÆ.

Percoidei, pt., *Cuv. Règne Anim.*; *Cuv. & Val. Hist. Nat. des Poiss.* iii. p. 419; *Müll. Berl. Abhandl.* 1844, p. 201.
Percidæ, pt., *Owen, Lect. on Compar. Anat.* p. 49.
Mullidæ, *Gray, Syn. Brit. Mus.* 1840; *Richardson.*

Body elongate, slightly compressed, *covered with large scales* without or with an extremely fine serrature. Profile of the head more or less parabolic; *hyal apparatus with two long barbels.* Lateral line continuous. Mouth in front of the snout, with the cleft lateral and rather small. Eye lateral, of moderate size. *Four branchiostegals*; pseudobranchiæ. Dentition feeble, more or less complete. *Two dorsal fins,* remote from each other; anal similar to the second dorsal; ventrals with one spine and five rays. Air-bladder, if present, simple and of variable size; stomach siphonal.

Inhabitants of nearly all the tropical seas, extending in Europe on to the coasts of the temperate region. Some species entering rivers.

Synopsis of the Genera.

Teeth in both the jaws, on the vomer and the palatine bones	1. UPENEOIDES.
Teeth in both the jaws and on the vomer; none on the palatine bones	2. UPENEICHTHYS.
No teeth in the upper jaw	3. MULLUS.
No teeth on the palate; teeth of the jaws in several series	4. MULLOIDES.
No teeth on the palate; teeth of the jaws in a single series	5. UPENEUS.

1. UPENEOIDES*.

Upeneus, sp., *Cuv. & Val.* iii. p. 448.
Upeneoides, *Bleeker.*

Teeth in both the jaws, on the vomer and palatine bones.
Red Sea; East Indian and Australian Seas.

1. Upeneoides vittatus.

Mullus vittatus, *Forskal, Faun. Arab.* p. 31; *L. Gm. Syst. Nat.* i. p. 1341; *Bl. Schn.* p. 79; *Lacép.* iii. pp. 382, 401. pl. 14. f. 1; *Shaw, Zool.* iv. p. 616. pl. 89.
Russell, pl. 158.
Mullus bandi, *Shaw, Zool.* iv. p. 615.

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* 1. Upeneus tæniopterus, *Cuv. & Val.* iii. p. 451.—Ceylon.
2. Mullus subvittatus, *Temm. & Schleg. Faun. Japon. Poiss.* p. 30.—Upeneus subvittatus, *Richardson, Ichth. China,* p. 219.—Japanese and Chinese Seas.

Upeneus vittatus et bivittatus, *Cuv. & Val.* iii. p. 448, vii. p. 520; *Rüpp. N. W. Fische*, p. 101.
—— bitæniatus, *Bennett, Proc. Comm. Zool. Soc.* 1830-31, p. 59.
Upeneoides bivittatus, *Bleeker, Perc.* p. 64, and *Amboina*, vi. p. 411.
—— vittatus, *Bleek. Act. Soc. Nederl.* ii. *Amboina*, p. 43.

D. 8 $\big|\,\frac{1}{8}$. A. 7. L. lat. 39. L. transv. 3/6.

The length of the head is $4\frac{1}{5}$ in the total; the barbels reach to the vertical from the angle of the præoperculum; the height of the spinous dorsal is four-fifths of that of the body. Body with two or three longitudinal bands, shining golden; the spinous dorsal with the top black, and with one or two blackish bands; the upper lobe of the caudal with three or four, the lower with two or three oblique black bands.

From the Red Sea to nearly all the Indian Seas.

a. Adult. Philippines.
b. Adult: very bad skin. Ceylon! Presented by the Zoological Society.
c. Half-grown. Amboyna. From Mr. Frank's Collection.
d. Half-grown. India. From the Haslar Collection.
e, f. Half-grown: very bad state. India.

2. Upeneoides tragula.

Upeneus tragula, *Richardson, Ichth. China*, p. 220.
Upeneoides variegatus, *Bleeker, Perc.* p. 64, and *Act. Soc. Nederl.* ii. *Amboina*, p. 48.

D. 8 $\big|\,\frac{1}{8}$. A. 7. L. lat. 30. L. transv. 2/5.

The length of the head is $4\frac{3}{4}$ in the total; the barbels do not reach to the vertical from the posterior margin of the præoperculum. The height of the spinous dorsal is three-quarters of that of the body. Vomerine teeth in two lateral stripes. Head, body, anal, pectoral, and ventral fins sparingly and irregularly spotted with brownish; a brown longitudinal band from the snout through the eye to the base of the caudal; dorsal fins largely marbled with blackish; each lobe of the caudal with five or six oblique brown cross-bands.

East Indian Archipelago; Chinese Sea.

a. Adult. Amboyna. From Mr. Frank's Collection.
b. Adult. Philippines.
c. Adult: stuffed. Canton. Presented by J. R. Reeves, Esq.
d. Adult: stuffed. Voyage of H.M.S. Herald.

3. Upeneoides sulphureus.

Valent. iii. p. 504. fig. 505; *Renard*, i. 43. 216.
Upeneus sulphureus, *Cuv. & Val.* iii. p. 450.
? Hypeneus vittatus, var., *Cant. Catal.* p. 35.
Upeneoides sulphureus, *Bleeker, Act. Soc. Nederl.* ii. *Amboina*, p. 45.

D. 8 $\big|\,\frac{1}{8}$. A. 7. L. lat. 38.

The length of the head is $4\frac{1}{5}$–$4\frac{1}{2}$ in the total; the height of the spinous dorsal is $1\frac{1}{5}$ or $1\frac{1}{3}$ in that of the body. Rose-coloured, with five yellow longitudinal bands; belly yellow. The dorsal fins with two or three longitudinal bands, and with the top black. The caudal white-edged, the upper lobe brownish.

Red Sea; East Indian Archipelago; Chinese Sea.

a. Half-grown. Red Sea. Purchased of Mr. Frank.
b. Half-grown: not good state. Amboyna. Purchased of Mr. Frank.
c. Half-grown. China. Presented by J. R. Reeves, Esq.
? *d*. Half-grown: stuffed. New Hebrides. Voyage of the Herald.

4. Upeneoides moluccensis.

Bleeker, Amboina, vi. p. 409.

D. $7 \mid \frac{1}{8}$. A. 8. L. lat. 38–39.

The height of the body is $5\frac{1}{4}$ in the total length, the length of the head $4\frac{2}{5}$; the space between the orbits is flat. The vomerine teeth form a continuous angular band. The barbels do not reach to the posterior margin of the præoperculum. The height of the spinous dorsal is $1\frac{1}{4}$ in that of the body. Rose-coloured, with a yellow lateral band; the caudal and dorsal fins with alternate yellow and pearl-coloured bands; those of the spinous dorsal horizontal, those of the second dorsal and of the caudal oblique; the upper caudal lobe with blackish tip. (*Bl.*)

Sea of Amboyna.

5. Upeneoides bensasi.

Mullus bensasi, *Temm. & Schleg. Faun. Japon. Poiss.* p. 30. pl. 11. f. 2.
Upeneoides bensasi, *Bleek. Verh. Batav. Genootsch.* xxvi: *Japan*, p. 71.

D. $7 \mid \frac{1}{8}$. A. 7. L. lat. 30.

The height of the body is 5–$5\frac{1}{2}$ in the total length, the length of the head $4\frac{1}{2}$–$4\frac{2}{3}$. Vomerine teeth in an angular uninterrupted band. The height of the spinous dorsal not, or scarcely less than, that of the body. Rose-coloured: dorsal fins with two or three deep-red longitudinal bands; the upper caudal lobe with four oblique deep-red bands.

Japanese Sea.

6. Upeneoides sundaicus.

Upeneoides vittatus, *Bleeker, Perc.* p. 63.
—— sundaicus, *Bleeker, Amboina*, vi. p. 411, and *Act. Soc. Nederl.* ii. *Amboina*, p. 47.

D. $8 \mid \frac{1}{8}$. A. 8. L. lat. 34–35.

The length of the head is $4\frac{2}{5}$ to 5 in the total. The barbels reach to the posterior margin of the præoperculum. The spinous dorsal as high, or nearly as high as the body. Back light violet; a broad brown band from the eye to the caudal. Fins rose-coloured; the soft dorsal with five yellow longitudinal stripes; the upper caudal lobe with four or five yellow cross-bands, the lower margined with violet posteriorly.

East Indian Archipelago.

7. Upeneoides vlamingii.

Vlaming, no. 123; *Renard*, i. 5. 31.
Upeneus vlamingii, *Cuv. & Val.* iii. p. 452. pl. 71; *Richardson, Ann. & Mag. Nat. Hist.* 1842, ix. p. 211.

D. 8 | 9. A. 8. Cæc. pylor. ca. 30.

The height of the body equals the length of the head, and is $3\frac{2}{3}$ in the total. The barbels reach to the angle of the præoperculum. The vomerine teeth are divided into two lateral groups. Red; each scale with a violet speck, forming together longitudinal series; snout and cheeks with oblique violet streaks; the second dorsal and anal fins with longitudinal series of violet specks. (*Cuv.*)

Island of Motuaro, Queen Charlotte's Sound. (*Rich.*)

2. UPENEICHTHYS.

Upeneus, sp., *Cuv. & Val.* iii. p. 455.
Upeneichthys, *Bleeker.*

Teeth in both the jaws and on the vomer, none on the palatine bones.

Australian Seas, entering rivers.

1. Upeneichthys porosus.

Upeneus porosus, *Cuv. & Val.* iii. p. 455; *Less. Voy. Coq. Zool. Poiss.* p. 216.

D. 8 | 9. A. 7. L. lat. 28. L. transv. 2/6.

The barbels reach to the vertical from the extremity of the operculum. Two silvery streaks between the eye and the mouth, the lower continued below and behind the eye.

Seas of Australia, Van Diemen's Land, and New Zealand: entering rivers.

a. Adult: skin: not good state. Port Jackson. From Mr. Gould's Collection.
b. Half-grown: skin. Australia. From Mr. Gould's Collection.
c. Half-grown: skin. Australia. Voyage of H.M.S. Fly.
d. Half-grown. Australia. Presented by the Earl of Derby.
e–g. Adult: not good state. From the Haslar Collection.

3. MULLUS.

Mullus, *Linné*; *Cuv. Règne Anim.*; *Cuv. & Val.* iii. p. 422.

Teeth in the lower jaw, on the vomer and on the palatine bones, none in the upper jaw.

Mediterranean; Coasts of Temperate Europe.

1. Mullus barbatus.

Τρίγλα, *Aristot.* ii. cap. 17, iv. cap. 11, v. cap. 9, vi. cap. 17, viii. cap. 2 & 13, ix. cap. 2 & 37; *Ælian,* ii. cap. 41; *Athen.* vii. pp. 324, 325.
Mullus, *Ovid,* v. 123; *Plin.* ix. cap. 17, 18, 51; *Martial,* x. ep. 30, 31, xi. ep. 50; *Colum.* viii. cap. 17; *Salv.* fol. 235; *Willughby,* p. 285; *Ray,* p. 90.
Trigla, no. 1, *Artedi, Genera,* p. 43.
Mullus barbatus, *Linn. Syst. Nat.* i. p. 495; *Bl.* taf. 348. f. 2; *Mart. Reise nach Venedig,* ii. p. 426; *Cuv. & Val.* iii. p. 442. pl. 70; *Yarr. Brit. Fishes,* i. p. 36; *Nordm. in Demid. Voy. Poiss.* p. 373.
Mullus ruber, *Lacép.* iii. p. 385; *Shaw, Gen. Zool.* iv. p. 611.

B. 4. D. 7 | $\frac{1}{8}$. A. 2/6. L. lat. 40. Vert. 10/14.

The upper profile of the snout approaching the vertical line; the upper maxillary reaching beyond the vertical from the anterior margin of the eye. Red, without yellow stripes.

From the Mediterranean to the South coast of England.

a. Fine specimen. Madeira. Presented by the Rev. R. T. Lowe.
b. Adult: skeleton. Madeira. Presented by Sir A. Smith.
c. Adult: very bad state. Adriatic. From Mr. Frank's Collection.
d. Fourteen inches long. London market. Purchased.
e. Adult: stuffed. Devonshire.
f. Half-grown. Brighton. Presented by Mr. E. Gerrard.
g. Half-grown: skin. Europe. From Mr. Yarrell's Collection.

For a description of the skeleton see the following species.

2. Mullus surmuletus.

Mullus, *Plin.* ix. cap. 17.
Mullus major, *Salv.* fol 236; *Willughby,* p. 285; *Ray,* p. 91.
Trigla, no. 2, *Artedi, Genera,* p. 43.
Mullus surmuletus, *Linn. Syst. Nat.* i. p. 496; *Bloch,* taf. 57; *Lacép.* iii. p. 394; *Pennant, Brit. Zool.* iii. p. 368. pl. 64; *Linn. Faun. Suec. ed. Retz.* p. 341; *Brünn. Pisc. Mass.* p. 71; *Martens, Reise nach Venedig,* ii. p. 427; *Cuv. & Val.* iii. p. 433; *Cuv. Règne Anim. Ill. Poiss.* pl. 19. f. 2: *Yarrell, Brit. Fishes,* i. p. 31; *Guichen. Explor. Sc. Algér. Poiss.* p. 8.
—— barbatus, *De la Roche, Ann. Mus.* xiii. p. 316; *Gronov. Syst. ed. Gray,* p. 108*.

B. 4. D. 7 | $\frac{1}{8}$. A. 2/6. L. lat. 40. Cæc. pylor. 22. Vert. 10/14.

The upper profile of the snout very oblique; the upper maxillary reaching to the vertical from the anterior margin of the eye. Red, with three yellow longitudinal stripes.

From the Mediterranean to the Baltic.

a. Adult: stuffed. Brixham.
b, c. Adult. British Channel. London market.
d. Adult and half-grown. Madeira. From the Haslar Collection.

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* Gronovius considers *M. barbatus* as the male and *M. surmuletus* as the female of one and the same species.

e. Half-grown: skeleton. Mediterranean. From the Haslar Collection.
f. Half-grown. Dalmatia.
g. Half-grown. Dalmatia.
h. Adult: skin: bad state. From Gronovius's Collection.

Skeleton.—The doubts which I have always entertained on the specific difference between *Mullus barbatus* and *surmuletus* are still more increased by the examination of the skeletons. Both are so much like each other, that they need only one description. There is no difference at all between them except in the more abrupt upper profile of the snout in *M. barbatus*. The maxillary is thin, oblong, as broad at the base as at the extremity; the intermaxillary feeble, thin, with the posterior process shorter than the descending branch, which shows a flat prominence on its posterior margin. The mandibulary also is thin, with some pores, and becomes suddenly very narrow near the symphysis. The entopterygoid is well ossified, and extends upwards to the bony plate situated at the inner surface of the infraorbital ring; there is a wide slit between the epi- and pretympanic. The length of the inferior limb of the præoperculum is three-fifths of that of the posterior; both meet at a rounded angle; there is a rudimentary muciferous channel between the margin of the bone and the inner ridge, which is rounded and scarcely elevated. The operculum is irregularly quadrangular, the posterior side being emarginate. The sub- and interoperculum are thin. The præorbital is oblong, twice as long as wide, and very porous; the remainder of the infraorbital ring very narrow. The frontal bones are flat, with some slight ridges and grooves. The occipital crest is very feeble, and not more developed than the lateral crests; the interior lateral crest does not extend backwards to the articulation of the suprascapula. The basal portion of the brain-capsule is neither compressed nor rounded, and the basisphenoid has a large opening before the occipital joint. The barbels are fixed to the basihyal; the urohyal is formed by three plates, the two lower of which are rather convergent towards each other. The ulna and radius are dilated, and the openings between them and the humerus are very small. The inner plates of the pubic bones are broad, and joined together in their whole length.

There are ten abdominal and fourteen caudal vertebræ, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·4. The neural, hæmal, interneural and interhæmal spines are very feeble.

4. MULLOIDES*.

Upeneus, sp., *Cuv. & Val.* iii. p. 456.
Mulloides, *Bleek. Ceram,* ii. p. 697.

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* 1. Upeneus martinicus, *Cuv. & Val.* iii. p. 483.—Martinique.
2. —— parvus, *Poey, Memor. Cuba*, p. 226.—Cuba.—This fish may belong to another group.
3. —— balteatus, *Cuv. & Val.* iii. p. 484.—Cuba.—A very doubtful species.
4. —— mauritianus, *Benn. Proc. Comm. Zool. Soc.* i. p. 59.—Mauritius.

Teeth in both the jaws in several series, but neither on the vomer nor on the palatine bones.

From the Red Sea, through all the Indian Seas, to Polynesia. Atlantic coasts of Tropical America.

1. Mulloides flavolineatus.

Mullus flavolineatus, *Lacép.* iii. p. 406.
—— aureovittatus, *Shaw, Zool.* iv. p. 618.
Upeneus flavolineatus, *Cuv. & Val.* iii. p. 456; *Rüpp. N. W. Fische,* p. 101. t. 26. f. 1; *Jenyns, Zool. Beagle, Fishes,* p. 24
? Hypeneus flavolineatus, var., *Cant. Catal.* p. 36.
Mulloides flavolineatus, *Bleek. Ceram,* ii. p. 697.

D. $7 \mid \frac{1}{8}$. A. 8. L. lat. 35–36. L. transv. 2/5–6. Cæc. pylor. 18. Vert. 10/14.

The height of the body is $5\frac{1}{3}$ in the total length; the space between the eyes is $1\frac{1}{2}$ in the length of the snout, and flat; the barbels reach to the vertical from the angle of the præoperculum; the spinous dorsal is nearly as high as the body. A broad citrine band from the eye to the caudal; yellow streaks on the snout; fins immaculate.

From the Red Sea to the Chinese Sea.

a. Adult. Sine patria. From the Haslar Collection.
b. Adult male: skeleton. From the Haslar Collection.
c. Half-grown. China. Presented by Sir J. Richardson.
d. Half-grown. Madagascar. Presented by Dr. J. E. Gray.
e. Intestines of specimen *b*.

The *skeleton* differs very little from that of *Mullus barbatus*; the posterior process of the intermaxillary is more elongate, and equals in length the descending branch; the limbs of the præoperculum have a rectangular direction towards each other, the angle itself being slightly rounded. The basal portion of the brain-capsule is rounded; the length of the abdominal portion of the vertebral column is to that of the caudal as 1 : 1·46.

2. Mulloides flavovittatus.

Upeneus flavovittatus, *Poey, Memor. Cuba,* p. 224. lam. 17. f. 4.

D. 7 | 9. A. 7. L. lat. 38–41. L. transv. 3/7. Cæc. pylor. 10–18. Vert. 10/14.

The height of the body is one-fifth of the total length; the space between the eyes is $1\frac{1}{2}$ in the length of the snout, and flat; the barbels reach to the vertical from the angle of the præoperculum; the spinous dorsal is much lower than the body. A broad citrine band from the eye to the caudal; yellow streaks on the snout; fins immaculate.

Caribbean Sea.

a–c. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.

d. Large specimen. Cuba. From the Collection of the Zoological Society.

Poey attributes a single series of teeth to this species; but I can distinctly distinguish a band of several series of teeth, rather stronger than in the species with villiform bands.

3. Mulloides vanicolensis.

Upeneus vanicolensis, *Cuv. & Val.* vii. p. 521.
Mulloides vanicolensis, *Bleek. Ternate,* ii. p. 601.

D. $7 \mid \frac{1}{8}$. A. 8. L. lat. 35.

The height of the body is about one-fifth of the total length; the space between the eyes is very convex; the barbels reach to the posterior margin of the præoperculum. The scapula without spine. The spinous dorsal nearly as high as the body. Coloration uniform.

Seas of Ternate and Vanicolo.

4. Mulloides zeylonicus.

Upeneus zeylonicus, *Cuv. & Val.* iii. p. 459, vii. p. 520.

D. $7 \mid \frac{1}{8}$. A. 7.

The height of the body is $5\frac{1}{2}$ in the total length. The barbels do not reach beyond the angle of the præoperculum. Red: the first dorsal brownish yellow, the second with a black line along the base. (*Cuv.*)

Coasts of Trincomalee and New Guinea.

Air-bladder large.

5. Mulloides japonicus.

Mullus japonicus, *Houtt. Mém. Harl.* xx. p. 334; *L. Gm.* i. p. 1340; *Bl. Schn.* p. 79.
Upeneus japonicus, *Cuv. & Val.* iii. p. 460.

D. $7 \mid \frac{1}{8}$. A. 7.

Scapula with a small spine. Coloration uniform. (*Cuv.*)

Sea of Japan.

5. UPENEUS*.

Upeneus, sp., *Cuv. & Val.* iii. p. 461.
Upeneus, *Bleeker.*

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* 1. Mullus auriflamma, *Forsk.* p. 30; *Bl. Schn.* p. 79.—Upeneus auriflamma, *Cuv. & Val.* iii. p. 461.
2. —— chersercydros, *Lacép.* iii. p. 406.—Sciæna ciliata, *Lacép.* iv. pp. 308, 312.—Mullus radiatus, *Shaw,* p. 618.—Upeneus chersercydros, *Cuv. & Val.* iii. p. 470.—Indian Ocean.
3. Upeneus cinnabarinus, *Cuv. & Val.* iii. p. 475.—Ceylon.
4. —— fraterculus, *Cuv. & Val.* vii. p. 524.—Seychelles.
5. —— atherinoides, *Cuv. & Val.* vii. p. 526.—Guam.
6. —— cyprinoides, *Cuv. & Val.* vii. p. 526.—Ile de France.
7. —— luteus, *Cuv. & Val.* vii. p. 521; *Bleek. Perc.* p. 63.—Indian Ocean.

The teeth in both the jaws form a single series; palate without any teeth.

From the Red Sea, through all the Indian Seas, to Polynesia. Tropical parts of the Atlantic.

1. Upeneus barberinus.

Mullus barberinus, *Lacép.* iii. p. 406. pl. 13. f. 3.
Upeneus barberinus, *Cuv. & Val.* iii. p. 462; *Rüpp. N. W. Fische,* p. 101.

D. 8 | 9. A. 7. L. lat. 29–31. L. transv. 2/7. Vert. 10/14.

The height of the body is $4\frac{1}{3}$–$4\frac{1}{2}$ in the total length; the distance between the eyes is one-half the length of the snout; the barbels reach slightly beyond the vertical from the angle of the præoperculum. A black band from the eye along the lateral line to below the anterior half of the second dorsal; a round black spot on each side of the root of the caudal.

Red Sea; East Indian Seas.

a. Fine specimen. Moluccas.
b. Adult: skeleton. Amboyna. From the Collection of Madame Ida Pfeiffer.
c. Young. Amboyna. From the Collection of Madame Ida Pfeiffer.
d. Half-grown. Amboyna. Purchased of Mr. Frank.
e. Adult. India. From Mr. Frank's Collection.
f. Adult. India.
g. Adult. India.

The *skeleton* differs very distinctly from that of *Mullus* and of *Mulloides flavolineatus.* The maxillary is much narrower at the base than at the extremity; the posterior process of the intermaxillary is very short. The frontal bones are concave between the orbits, and there is a longitudinal crest along their meeting margins, extending nearly to the anterior end of the bones and not continued into the occipital crest, which is rather higher than the lateral ones. The angle of the præoperculum is as much rounded as in *M. barbatus*; the basal portion of the brain-capsule is neither compressed nor rounded. The length of the abdominal portion of the vertebral column is to that of the caudal as 1 : 1·7.

2. Upeneus macronemus.

Mullus macronemus, *Lacép.* iii. pp. 404, 405. pl. 13. f. 2.
—— auriflamma, *Lacép.* iii. p. 400 (not *Forsk.*).
Upeneus lateristriga, *Cuv. & Val.* iii. p. 463; *Rüpp. N. W. Fische,* p. 101.

D. 8 | 9. A. $\frac{1}{6}$.

The space between the eyes is somewhat sinuous. The barbels reach to the base of the ventrals; the last dorsal ray elongate. Rose-coloured: a brown longitudinal band from the nostrils through the eye to below the middle of the second dorsal; a brown spot on each side of the tail; the ventral fin, the anterior margin of the first dorsal, the lower half of the second, and the lateral margin of the caudal fin are brown. The anal fin and the upper half of the second dorsal yellowish, with violet longitudinal lines. (*Rüpp.*)

Red Sea.

3. **Upeneus barberinoides.**

Bleeker, Amboina & Ceram, p. 263.

D. $8 \left| \frac{1}{8} \right.$. A. 8. L. lat. 30.

The height of the body is $4\frac{1}{4}$–$4\frac{1}{2}$ in the total length, the length of the head about four times. The barbels reach slightly beyond the posterior margin of the præoperculum. Red: the dorsal scales with a reddish-violet centre; a lateral brown band from the snout through the eye to below the anterior portion of the soft dorsal; opercles with a large brown spot besides, extending on the side of the body; a blackish spot on the lateral line, corresponding to the extremity of the second dorsal; the soft dorsal with a bluish-black base, and with alternate yellow and blue stripes on its upper half. (*Bl.*)

Northern coast of Ceram.

4. **Upeneus indicus**

Russell, ii. p. 42. pl. 157.
Mullus indicus, *Shaw, Zool.* iv. pt. 2. p. 614.
Upeneus russellii, *Cuv. & Val.* iii. p. 465; *Richards. Ichth. China,* p. 220; *Bleeker, Perc.* p. 62.
? Upeneus waigiensis, *Cuv. & Val.* iii. p. 466.

D. 8 | 9. A. $\frac{1}{7}$. L. lat. 30. L. transv. 3/7.

Interspace between the eyes rather flat; the barbels reach slightly beyond the angle of the præoperculum. A shining golden spot on the lateral line, disappearing after death; a black blotch on each side of the tail, on the lateral line, between the dorsal and caudal fins.

East Indian Seas.

a. Thirteen inches long: stuffed. China. Presented by J. R. Reeves, Esq.
b. Adult: stuffed. China. Presented by J. R. Reeves, Esq.

5. **Upeneus spilurus.**

Bleeker, Japan, p. 395, and *Verhand. Batav. Genootsch.* xxvi. *Japan,* p. 68. tab. 2. f. 2.

D. $8 \left| \frac{1}{8} \right.$. A. 8. L. lat. 28.

The height of the body is nearly equal to the length of the head, and $4\frac{1}{2}$ in the total. Scales ctenoid (?). The spinous dorsal much lower than the body. Rose-coloured; a large round black spot above the lateral line, between the second dorsal and caudal. (*Bl.*)

Sea of Japan.

6. Upeneus pleurospilos.

Bleeker, Natuurk. Tydschr. Nederl. Ind. iv. p. 110, and *Verhand. Batav. Genootsch.* xxvi. *Japan,* p. 69.

D. $8 \mid \frac{1}{8}$. A. 8. L. lat. 30.

The height of the body is nearly equal to the length of the head, and $4\frac{1}{2}$ in the total. The barbels reach to the posterior margin of the operculum. The spinous dorsal much lower than the body. Rose-coloured: each scale of the back and of the sides with a central reddish-violet spot; a black spot below the lateral line, corresponding to the posterior part of the spinous dorsal; cheeks and snout with bluish stripes; the second dorsal with two blue longitudinal bands; the caudal, anal, and ventral fins with yellow bands. (*Bl.*)

Seas of Japan and Amboyna.

7. Upeneus brandesii.

? Upeneus pleurostigma, *Benn. Proc. Comm. Zool. Soc.* i. p. 59.
Upeneus brandesii, *Bleeker, Banda,* i. p. 236.

D. $8 \mid \frac{1}{8}$. A. 8. L. lat. 30.

The height of the body is one-fifth of the total length, the length of the head one-fourth. The barbels reach to the posterior margin of the præoperculum. Red: a large round black spot on the lateral line between the dorsals; the second dorsal with a large black basal spot. (*Bl.*)

Sea of Banda Neira (and of Mauritius?).

8. Upeneus malabaricus.

Cuv. & Val. iii. p. 467.

D. 8 | 9. A. 7. L. lat. 30. L. transv. 3/7.

The barbels reach beyond the angle of the præoperculum. A large ovate white spot on the lateral line, above the extremity of the pectoral; a black spot on each side of the root of the tail.

Coast of Malabar; Philippine Islands.

a. Half-grown. Philippines.

9. Upeneus trifasciatus.

Mullus bifasciatus, *Lacép.* iii. p. 404. pl. 14. f. 2.
—— trifasciatus, *Lacép.* iii. p. 404. pl. 15. f. 1.
—— multifasciatus, *Quoy & Gaim. Voy. Freyc.* pl. 59. f. 1.
Upeneus bifasciatus, *Cuv. & Val.* iii. p. 468.
—— trifasciatus, *Cuv. & Val.* iii. p. 468; *Jenyns, Zool. Beagle, Fishes,* p. 25; *Bleek. Banda,* i. p. 237.

D. 8 | 9. A. 7. L. lat. 30. L. transv. 3/7. Vert. 10/14.

The distance between the eyes is convex, and $1\frac{2}{3}$ in the length of the snout. A broad black cross-band over the tail, a second from the anterior portion of the soft dorsal; the space between the two bands yellow or white; sometimes a third black band from the spinous dorsal. An oblong black spot behind the eye. The basal half of the second dorsal black, the upper half with white longitudinal bands; the anal with blackish longitudinal bands.

From the Indian Ocean to Polynesia.

a. Adult. China. Presented by Sir J. Richardson.
b. Adult. China.
c. Young. Amboyna. Purchased of Mr. Frank.
d. Half-grown. Celebes.
e. Adult: skin: bad state. Ceylon. Presented by the Zoological Society.
f. Adult: skeleton. India. From Mr. Frank's Collection.
g. Half-grown. India. From Mr. Frank's Collection.
h. Half-grown. India. From the Haslar Collection.
i. Half-grown. India. From the Haslar Collection.

Var.—Anterior portion of the body black, with two white longitudinal bands, one from the muzzle above the eye to the origin of the soft dorsal; the second oblique, from the cheek below the eye to the lateral line. A black spot on each side of the tail instead of the caudal band.

k. Half-grown. East Indies. From Mr. Frank's Collection.

The skeleton of this species is entirely similar to that of *Upeneus barberinus*: the length of the abdominal portion of the vertebral column is to that of the caudal as 1 : 1·6.

10. Upeneus maculatus.

Margrave, pp. 156, 181.
Mullus maculatus, *Bl.* taf. 348. f. 1.
Upeneus maculatus, *Cuv. & Val.* iii. p. 478; *Poey, Mem. Cub.* p. 223; *Casteln. Anim. nouv. ou rares Amér. Sud*, p. 6.

D. 8 | 9. A. 7. L. lat. 30. L. transv. 3/6.
Cæc. pylor. 8–9 (*Cuv.*; 18, *Poey*). Vert. 10/14.

The height of the body is 4½ in the total length; the interspace between the eyes one-half of the length of the snout, and flat. Two black blotches on the lateral line, corresponding to the two dorsal fins.

Atlantic coasts of Tropical America.

a–i. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.
k. Half-grown.
l. Half-grown. West Indies.
m. Adult: stuffed. West Indies. From Mr. Scrivener's Collection.

11. Upeneus punctatus.

Cuv. & Val. iii. p. 482.

D. 7 | 9. A. 7.

Red, each scale with a lilac centre; on each side of the snout three lilac streaks; on each side of the body four or five clouded brownish spots. (*Cuv.*)

Sea of Martinique.

12. Upeneus prayensis.

Cuv. & Val. iii. p. 485; *Jenyns, Zool. Beagle, Fishes,* p. 26.

D. 8 | 9. A. 7. L. lat. 30. L. transv. 3/6.

The height of the body is $4\frac{2}{3}$ in the total length; the distance between the eyes is flat, and one-half of the length of the snout; the barbels reach nearly to the vertical from the opercular spine. Coloration uniform (in spirits), except a small black spot behind the eye, at the upper extremity of the præoperculum, and a blackish longitudinal band on the soft dorsal.

West coast of Africa.

a. Half-grown. River Niger. From Mr. Fraser's Collection.

13. Upeneus cyclostoma.

Mullus cyclostomus, *Lacép.* iii. p. 404. pl. 19. f. 3 (very bad).
Sciæna heptacanthus, *Lacép.* iv. pp. 308, 312.
Upeneus cyclostomus, *Cuv. & Val.* iii. p. 472; *Rüpp. N. W. Fische,* p. 101.
? Upeneus immaculatus, *Benn. Proc. Comm. Zool. Soc.* i. p. 60.

D. 8 | 9. A. 7. L. lat. 27–30. L. transv. 2/7.

The height of the body is $4\frac{1}{3}$ in the total length; the diameter of the eye is one-fifth of the length of the head, and less than one-half of that of the snout. The snout not pointed; the distance between the eyes is convex, and $1\frac{3}{5}$ in the length of the snout. The height of the spinous dorsal is two-thirds of that of the body. The tubes of the lateral line with very short lateral branches. The barbels reach to, or nearly to, the base of the ventrals. Coloration uniform (in spirits).

From the Red Sea, through the Indian Ocean, to the Indian Archipelago.

a. Fine specimen. Moluccas. From the Leyden Museum as *Upeneus luteus.*

b. Half-grown. Ceram and Amboyna. From Madame Ida Pfeiffer's Collection.

c. Adult: stuffed. Louisiade Archipelago. Voyage of the Rattlesnake.

d. Young: stuffed. Louisiade Archipelago (30 fathoms). Voyage of the Rattlesnake.

e. Half-grown: stuffed. Redscar Bay (S.E. coast of New Guinea; on mud). Voyage of the Rattlesnake.

14. Upeneus oxycephalus.

Bleeker, Act. Soc. Sc. Indo-Nederl. i. *Manado en Makass.* p. 45.

D. $8 \left| \frac{1}{8} \right.$. A. 8. L. lat. 30.

The height of the body is $4\frac{1}{2}$–$4\frac{3}{5}$ in the total length, the length of the head $3\frac{4}{5}$–4; the space between the orbits convex; the greater part of the eye is situated on the posterior half of the length of the head, in which it is contained 5–$5\frac{1}{3}$ times; the snout is pointed, and longer than twice the diameter of the eye. The barbels reach to the base of the ventrals; the height of the spinous dorsal is $1\frac{2}{3}$ in that of the body. Rose-coloured; two blue stripes on the side of the snout, and two or three others on the side of the head. The second dorsal and the anal bright yellow, with three to five bluish longitudinal bands. (*Bl.*)

Sea of Manado (and Ile de France).

a. ? Adult: stuffed. Mauritius. From Dr. Janvier's Collection.

15. **Upeneus chrysopleuron.**

Mullus chrysopleuron, *Temm. & Schleg. Faun. Japon. Poiss.* p. 29. pl. 12. f. 1.
Upeneus biaculeatus, (*Gray*) *Rich. Ichth. China*, p. 219*.
Upeneoides chrysopleuron, *Bleek. Verhand. Batav. Genootsch.* xxv. *Japan*, p. 10.
Upeneus chrysopleuron, *Bleek. l. c.* xxvi. *Japan*, p. 70.

D. $8 \mid \frac{1}{8}$. A. 8. L. lat. 30.

The height of the body is nearly equal to the length of the head, and $4\frac{1}{2}$ in the total. The length of the snout is twice the diameter of the eye. Crown rather flat; the teeth of the jaws of unequal size. The spinous dorsal much lower than the body. Rose-coloured, with a broad golden band from the head to the caudal, extending on the back of the tail; snout with bluish streaks; fins immaculate; a small blackish spot above the axil.

Seas of Japan and China.

a. Adult. China. Presented by J. R. Reeves, Esq.
b. Half-grown. China Presented by J. R. Reeves, Esq.
c. Adult. China.
d. Adult. China.
e. Adult: stuffed. Presented by J. C. Jerdon, Esq.
f. Half-grown. Presented by the Zoological Society.

16. **Upeneus jansenii.**

Bleeker, Act. Soc. Sc. Indo-Nederl. i. *Man. en Makass.* p. 44.

D. $8 \mid \frac{1}{8}$. A. 8. L. lat. 30.

The height of the body is about one-fifth of the total length, the length of the head one-fourth; the diameter of the eye is about one-fourth of the latter, and much more than one-half the extent of the snout. Crown rather flat. The barbels reach to the posterior margin of the præoperculum. The height of the spinous dorsal is $1\frac{2}{3}$ in that of the body. Uniform rose-coloured.

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* Sir J. Richardson quotes as the first authority, "Gray, Catal. Brit. Mus." A catalogue containing an account of this fish has never been published, to my knowledge.

Seas of Manado and Amboyna.

a, b. Half-grown. Amboyna. Purchased of Mr. Frank.

17. **Upeneus dubius.**

Mullus dubius, *Temm. & Schleg. Faun. Japon. Poiss.* p. 30. pl. 11. f. 3.

D. $7 \mid \frac{1}{8}$. A. $\frac{1}{6}$.

Red, with a yellow longitudinal band; dorsal and anal fins with oblique brown longitudinal bands. (*Schleg.*)

Sea of Japan.

18. **Upeneus bilineatus.**

Cuv. & Val. vii. p. 525.

D. $7 \mid \frac{1}{8}$. A. 7.

Snout short, with the upper profile approaching the vertical line, as in *Mullus barbatus*. Barbels rather short. Back brownish; two yellow stripes along the side of the body; the top of the first dorsal black. (*Val.*)

Sea of Amboyna.

19. **Upeneus crassilabris.**

Cuv. & Val. vii. p. 523.

D. $8 \mid \frac{1}{8}$. A. 7.

The height of the tail is one-half of that of the body. Lips thick. The barbels do not reach to the base of the ventrals. Ventrals very large. The first dorsal violet; the second violet on the base, and with violet stripes on its upper half; anal dotted and obliquely striped with violet; caudal dark-coloured, dotted with white; the three outer rays of the ventral violet; barbels brownish. (*Val.*)

Fam. 7. SPARIDÆ.

Sparoidei, pt., et Squamipinnes, pt., *Cuv. Règne Anim.*; *Cuv. & Val. Hist. Nat. des Poiss.*; *Müller, Berl. Abhandl.* 1844, p. 201.
Sparidæ, pt., et Chætodontidæ, pt., *Richardson.*

Body compressed and oblong, covered with scales, the serrature of which is exceedingly minute, and sometimes wanting. Tail not armed. Lateral line continuous, not continued on the caudal fin. Mouth in front of the snout, with lateral cleft. Eye lateral, of moderate size. Five, six or seven branchiostegals. *Either trenchant teeth in front of the jaws, or lateral series of molar teeth**; generally no teeth on the palate. One dorsal fin, formed by a spinous and soft portion of nearly equal development; anal with three spines; the lower rays of the pectorals generally branched, in one group simple; ventrals thoracic, with one spine and five rays. The bones of the head with a rudimentary muciferous system. Air-bladder present, often bifid posteriorly. Pseudobranchiæ well developed.

Herbi- and carnivorous fishes, inhabiting the seas of the temperate and tropical regions; a few entering rivers.

Synopsis of the Groups.

a. **Cantharina.** More or less broad, trenchant teeth in front of the jaws; no molars or vomerine teeth; the lower pectoral rays branched.—Mostly vegetable feeders.

b. **Haplodactylina.** Trenchant teeth in front; no molars; the lower pectoral rays simple.—Vegetable feeders.

c. **Sargina.** Trenchant teeth in front and molar teeth on the sides.—Mostly carnivorous.

d. **Pagrina.** Conical teeth in front and molars on the sides.—Carnivorous.

e. **Pimelepterina.** Trenchant teeth in front; teeth on the palate.—Carnivorous?

[Appendix: Boridia.]

First Group. CANTHARINA.

Sparidæ with more or less broad, trenchant teeth in front of the jaws; no molars or vomerine teeth; the lower pectoral rays branched.

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* Some species of *Lethrinus* appear to make an exception, but their teeth are thick, and approach to molars; they are, moreover, readily distinguished by their naked cheek.

Synopsis of the Genera.

* Cheeks and opercles scaly; vertical fins without scales.	
A band of cardiform teeth in front of both jaws, the outer series containing teeth, which are slightly compressed and lanceolate	1. CANTHARUS.
A single series of trenchant, notched teeth in both jaws, without a band of other teeth behind	2. BOX.
A single series of broad lanceolate teeth in both jaws, without any other teeth behind	3. SCATHARUS.
A single series of broad, trenchant teeth in both jaws, with granular teeth behind and pointed ones on the side	4. OBLATA.
One or two series of broad, trenchant teeth, and with a band of granulated teeth behind; no pointed lateral teeth	5. CRENIDENS.
** Cheeks and opercles scaly; vertical fins more or less covered with scales.	
A series of broad lanceolate teeth in both jaws, with a band of similar teeth behind, which are less developed. Eleven dorsal spines	6. PACHYMETOPON.
Dorsal fin deeply notched. Ten dorsal spines	7. DIPTERODON.
A recumbent spine before the dorsal fin	8. PROTERACANTHUS.
*** Cheeks scaly, opercles naked.	
Scales moderate; fourteen or fifteen dorsal spines	9. GIRELLA.
Scales moderate; twelve dorsal spines	10. DOYDIXODON.
Scales small	11. TEPHRÆOPS.
**** Cheeks naked.	
Scales moderate	12. GYMNOCROTAPHUS.

1. CANTHARUS*.

Cantharus, *Cuv. Règne Anim.*; *Cuv. & Val.* vi. p. 318.

Teeth cardiform or villiform, those of the outer row slightly compressed and lanceolate†; no molar teeth. Cheeks scaly. The dorsal spines (ten or eleven) can be received into a scaly sheath; three anal spines. Scales moderate. Six branchiostegals. Pyloric appendages in small number. Air-bladder with two horns posteriorly.

Mediterranean; from the coasts of Great Britain round the Cape to the Seychelles.

1. Cantharus lineatus.

? Κάνθαρος, *Aristot.* viii. cap. 13.
Cantharus, *Rondel.* v. cap. 4. p. 120; *Gesner*, p. 178; *Aldrov.* ii. cap. 20. p. 186; *Willughby*, p. 309; *Ray*, p. 130.

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* 1. Cantharus senegalensis, *Cuv. & Val.* vi. p. 337.—Cape Verde.

† This is very conspicuous in mature specimens, and has been overlooked by Cuvier. Therefore I separate these fishes from the *Pristipomatidæ*, and do not think that the Indian species are to be referred to this genus.

Sparus, no. 2, *Artedi, Genera*, p. 36.
—— cantharus, *L. Gm.* p. 1274; *Bl. Schn.* p. 17; *Duhamel, Pêches*, ii. sect. 4. pl. 7. f. 1.
—— lineatus, *Montagu, Mem. Wern. Soc.* ii. 1815, p. 451. pl. 23.
—— vetula, *Couch, Trans. Linn. Soc.* xiv. p. 79.
—— sciandra (*Rudolphi*), *Rosenth. Ichthyot. Tafeln.* taf. 14. f. 1.
Pagrus lineatus, *Flem. Brit. Anim.* p. 211.
Cantharus vulgaris, *Cuv. & Val.* vi. p. 319. pl. 160; *Guichen. Explor. Sc. Algér. Poiss.* p. 53.
—— griseus, *Cuv. & Val.* vi. p. 333; *Jen. Brit. Vert.* p. 358; *Yarrell, Brit. Fishes*, p. 130; *Lowe, Trans. Zool. Soc.* ii. p. 178.
—— lineatus, *White, Catal. Brit. Fishes*, p. 16.

By an examination of several specimens from the Mediterranean and the Canary Islands, as well as from the British Channel, it is evident that the few differences on which Valenciennes separated the *C. griseus* from *C. vulgaris* must have been merely accidental in the individuals from which the descriptions were taken. In the 'Histoire Naturelle des Iles Canariens, par Webb et Berthelot,' Valenciennes says, that *C. griseus* is not found in those seas, and that the *C. griseus*, Lowe, is to be referred to *C. vulgaris*. There are specimens in the British Museum (one was sent by the Rev. R. T. Lowe) which really agree better with *C. griseus*, Val. But other specimens from the British coast have the præorbital as slightly notched as it is stated to be by Valenciennes in the Mediterranean fish; others from the Mediterranean have six series of præopercular scales, as well as those from the Channel.

D. $\frac{11}{12}$. A. $\frac{3}{10}$. L. lat. 68–75. L. transv. $\frac{9-10}{19}$. Vert. 10/14.

The height of the body is 3–3¼ in the total length, the length of the head 4½, the diameter of the eye is about one-fourth of the latter (in young and half-grown individuals larger), and equal to, or rather shorter than, the snout. There are six (or seven) series of scales between the præorbital and the præopercular limb; præorbital notched by the maxillary bone. The dorsal spines rather slender and flexible, the fourth, fifth and sixth the highest, and longer than any of the rays. Caudalis emarginate; the anal spines very much shorter than the rays. Greyish green, with darker longitudinal lines; fins blackish grey.

a. Adult: stuffed. Polperro.
b. Adult: stuffed. Plymouth. Presented by Lieut. H. F. Spence, R.N.
c. Adult: stuffed. Plymouth.
d, *e*. Eighteen inches long: skins. Plymouth. From Mr. Yarrell's Collection.
f. Half-grown. British Channel.
g. Adult: stuffed. Frith of Forth. From Dr. Parnell's Collection.
h. Adult: stuffed. England. From Mr. Yarrell's Collection.
i. Fine specimen. Lanzarote. Presented by the Rev. R. T. Lowe.
k. Half-grown: stuffed. Santa Cruz, Teneriffe.
l. Half-grown. From the Haslar Collection.
m–p. Adult: stuffed.

q–s. Half-grown: stuffed.
t. Half-grown: not good state. Mediterranean. Purchased of Mr. Frank.
u. Half-grown: skin. Mediterranean. From the Collection of the Zoological Society.
v. Half-grown. From the Haslar Collection.
w. Half-grown: bad state. From the Old Collection.
x. Adult. From the Old Collection.
y–γ. Adult: skins. From Mr. Yarrell's Collection.
δ. Half-grown: skin. From Gronov's Collection.
ε. Adult: skeleton.

Skeleton.—The maxillary bone is oblong, straight, with a longitudinal ridge, and provided above and behind with a semicircular flat process. The intermaxillary is rather narrow, styliform, with the posterior processes shorter than the descending branches. The mandibula has a narrow cleft between the dentary and articular bones, and several very distinct pores of the muciferous channel. The vomer has a rather irregularly quadrangular and slightly concave head, and terminates in a long tapering tail. The marginal part of the præoperculum is very thin; the length of the inferior limb is two-thirds of that of the posterior; both meet at a right angle, which, however, is rounded. The præopercular ridge is rather low, with a narrow muciferous channel. The operculum is irregularly quadrangular, with the upper side shortest, and the posterior slightly emarginate; there is a very slight ridge on the inner surface of the bone, descending obliquely downwards, and not terminating in a point; the surface near the upper angle is roughened by pores. The suboperculum is rather shorter and narrower than the interoperculum. The turbinal bones are somewhat elongate, transformed into a muciferous channel, and widened posteriorly. The præorbital is of moderate width, tapering posteriorly, with the anterior margin convex; the remainder of the infraorbital ring is very narrow. There is an excavated bony plate at its inner side, to support the eyeball from beneath; this plate articulates with the pterygoid by a rather strong process. The frontals form a high and very convex bony protuberance, pierced by several pairs of pores, whilst the superciliary portion is thin, and without bony excrescences; from that bony protuberance arises the high, triangular, occipital crest, with the upper margin slightly convex. The lateral crests also are well developed. The basal portion of the brain-capsule is slightly compressed. The glosso-hyal rather short, cuneiform, with the anterior extremity thickest. The urohyal is very deeply notched posteriorly, terminating in two processes, the upper of which is flat, in a vertical direction, whilst the lower horizontal one is again forked, and forms two long spines. The pubic bones are elongate, each being formed by three lamellæ of nearly equal development.

There are ten abdominal and fourteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·34. The neural spines are of moderate length; those of the first caudal vertebræ are the longest, as long as three of the latter together. The interneurals are much dilated; there are three spurious interneurals. The first interhæmal is rather slender, equal to the length of the first six vertebræ.

The *teeth* form, in both the jaws, broad cardiform bands, and the anterior ones are distinctly compressed and lanceolate.

2. Cantharus brama.

Duhamel, Pêches, ii. sect. 4. pl. 4. f. 1.
Sparus brama, *Bloch,* v. p. 77 (not fig.).
Cantharus brama, *Cuv. & Val.* vi. p. 328; *Guichen. Explor. Sc. Algér. Poiss.* p. 53; *Expéd. Sc. Morée, Zool.* pl. 17. f. 1 *a, b.*

D. $\frac{11}{12}$. A. $\frac{3}{10}$.

Very similar to *C. lineatus*; it is said to have the præorbital not notched. (*Val.*)

Mediterranean.

3. Cantharus orbicularis.

Cuv. & Val. vi. p. 331; *Bonap. Faun. Ital. Pesci,* pl.

D. $\frac{11}{12}$. A. $\frac{3}{10}$. L. lat. 70.

The height of the body is $2\frac{1}{2}$ in the total length; præorbital without notch; the sixth dorsal spine the highest.

Coast of Corsica.

4. Cantharus emarginatus.

? Cantharus emarginatus, *Cuv. & Val.* vi. p. 338.

D. $\frac{11}{12}$. A. $\frac{3}{11}$. L. lat. 80. L. transv. 13/21.

The height of the body is one-third of the total length, the length of the head is $4\frac{1}{4}$ in it; the diameter of the eye is about one-fourth of the latter, less than the distance between the eyes, and nearly equal to the length of the snout. There are eight series of scales between the præorbital and the præopercular limb; præorbital notched by the maxillary bone, which has a rather sharp longitudinal ridge. Dorsal rather low. Caudalis emarginate, the third anal spine shorter than the dorsal spines. Coloration uniform (in a dried state).

? Cape Seas.

a. Adult: stuffed.

5. Cantharus blochii.

Sparus brama, *Bloch,* taf. 279 (not descr.).
Cantharus blochii, *Cuv. & Val.* vi. p. 339.

D. $\frac{10}{12}$. A. $\frac{3}{10}$. L. lat. 64. L. transv. 9/18. Cæc. pylor. 3 (4?). Vert. 11/13.

The height of the body is $3\frac{1}{5}$ in the total length, the length of the head $4\frac{1}{4}$; the diameter of the eyes is $1\frac{2}{3}$ in the distance between them, and about one-fourth of the length of the head. The anterior teeth broad, lanceolate. There are about eleven series of scales between the præorbital and the præopercular limb, which is covered with scales. The dorsal spines moderate and rather short; the fourth one-third of the length of the head. The anal spines of moderate size. Uniform brownish.

Cape Seas.

a. Adult: stuffed. Cape Seas. Presented by Sir A. Smith.
b. Adult: skin. False Bay.
c. Adult: skin. From Gronov's Collection.

6. **Cantharus grandoculis.**

Cuv. & Val. vi. p. 341; *Cuv. Règne Anim. Ill. Poiss.* pl. 35. f. 3.

D. $\frac{10}{10}$. A. $\frac{3}{10}$.

Nape of the neck slightly concave; the greatest depth of the body is below the posterior dorsal spines, where it is contained three times in the total length. Præorbital without notch. The diameter of the eye is $2\frac{1}{2}$ in the length of the head. Four series of scales on the præoperculum. Spines of the fins strong. Greenish; dorsal spotted with violet; ventrals blackish. (*Val.*)

Seychelles.

I very much doubt whether the three following species, referred by Valenciennes to *Cantharus*, really belong to this genus or to this family at all.

7. **Cantharus cæruleus.**

Cuv. & Val. vi. p. 342.

D. $\frac{12}{10}$. A. $\frac{3}{10}$.

Body ovate, obtuse in front; præorbital without notch, caudal forked. The soft portion of the dorsal and anal fins elongate. Bluish; a bluish streak from the muzzle to the orbit. (*Val.*)

Sea of Guam (Mariannes).

8. **Cantharus maculatus.**

Cuv. & Val. vi. p. 343.

D. $\frac{10}{11}$. A. $\frac{3}{11}$.

Body ovate, elongate; snout obtuse; præorbital narrow, without notch. The spinous dorsal low, the soft and the anal fin high; caudal slightly forked. Red, with three series of irregular, rounded, white spots; fins brown, the caudal and the margin of the soft dorsal yellow. (*Val.*)

Indian Ocean.

9. Cantharus lineolatus.

Cuv. & Val. vi. p. 344.

D. $\frac{10}{13}$. A. $\frac{3}{13}$.

Body ovate; præorbital narrow; caudal truncated. Brown, with lighter spots and lineolated with white; fins brown, sparingly spotted with white. (*Val.*)

Indian Ocean.

2. BOX*.

Box (Boops), *Cuv. Règne Anim.*; *Cuv. & Val.* vi. p. 346.

In both jaws a single anterior series of broad incisors, notched at the cutting margin; no molars. Cheeks scaly. The dorsal spines (eleven to fifteen) can be received into a scaly sheath; anal spines three. Scales moderate. Six branchiostegals. Pyloric appendages in small number; air-bladder with two horns posteriorly. Intestinal tractus elongate.

Vegetable feeders. From the Mediterranean; Western coasts of Europe and Africa; Caribbean Sea; one species from the East Indies.

1. Box vulgaris.

Βὼξ, *Aristot.* ix. cap. 3; *Oppian*, i. p. 5.
Box, *Plin.* xxxii. cap. 11; *Bellon.* p. 230.
Boops, *Rondel.* v. c. 11. p. 136; *Gesner*, p. 127; *Aldrov.* ii. c. 41. p. 231; *Willughby*, p. 317; *Ray*, p. 135.
Sparus, no. 6, *Artedi, Gen.* p. 36.
—— boops, *Linn. Syst. Nat.* i. p. 469; *L. Gm.* p. 1274; *Brünn. Pisc. Mass.* p. 44; *Lacép.* iv. pp. 97, 99; *Bl. Schn.* p. 273; *Risso, Ichth. Nice*, p. 242; *Martens, Reise nach Venedig*, ii. p. 424.
Box vulgaris, *Cuv. & Val.* vi. p. 348. pl. 161; *White, Catal. Brit. Fishes*, p. 20; *Cuv. Règne Anim. Ill. Poiss.* pl. 36. f. 1 (not good); *Guichenot, Explor. Sc. Algér. Poiss.* p. 54.
Boops canariensis, *Valenc. in Webb & Berthel. Hist. Nat. Iles Canar. Poiss.* p. 36. pl. 10. f. 1.

D. $\frac{14}{14}$. A. $\frac{3}{15}$. L. lat. 75. L. transv. 6/13. Cæc. pylor. 5.
Vert. 11/13.

Body elongate, somewhat cylindrical; caudal deeply forked. Yellowish olive, with golden longitudinal bands.

Mediterranean; Canary Islands. Occasionally on the southern coast of England. Caribbean Sea.

a. Adult: stuffed. Mediterranean. Purchased of Mr. Argent.
b. Half-grown. Dalmatia.
c. Fine specimen. Madeira. From the Haslar Collection.
d. Skeleton. Madeira. From the Rev. R. T. Lowe's Collection.
e. Half-grown: skin: not good state. Santa Cruz (Teneriffe).
f. Adult. Lisbon. Presented by P. Hough, Esq.
g. Young. Lisbon.
h. Young. Lisbon.

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* 1. Box salpoides, *Cuv. & Val.* vi. p. 365.—East Indies.

i. Adult: skin: very bad state Falmouth fish-market. Presented by W. P. Cork, Esq.
k. Adult. Old Collection.
l. Half-grown: bad state.
m. Half-grown: bad state.
n. Half-grown: stuffed. From Mr. Yarrell's Collection.
o. Young.
p. Adult: skin. From Gronov's Collection.

Var. CARAIBICA, an species?

q. Fine specimen. St. Vincent's. From Mr. Macgillivray's Collection.

$$D.\ \frac{15}{14}.\quad A.\ \frac{3}{16}.\quad L.\ lat.\ 80.\quad L.\ transv.\ 8/15.$$

This specimen differs more from the Mediterranean fish than the *Boops canariensis* of Valenciennes, having smaller scales above the lateral line; but the wider the range of a species, and the more numerous it is in individuals, the more caution is required in separating new forms from it, as after all it may prove to be a climatic or an accidental variety. But the fish is very interesting, as a specimen of *Box* has not yet been found in the West Indies.

Skeleton.—The occipital crest and the two lateral crests are thin, feeble, and moderately elevated; the former does not extend on the frontal bones, and the latter emit a flat free process posteriorly. The upper surface of the frontal bones is roughened by low irregular ridges and grooves; there is a shallow median groove along the suture of the bones. The turbinal bones are transformed into a rather elongate tube. The posterior process of the intermaxillary is shorter than the descending branch of the bone; the mandibula is of moderate length, as long as the præorbital. The vomer is cuneiform, flat. The præorbital is elongate, slightly tapering posteriorly; the remainder of the infraorbital arch is somewhat narrower, without interior plate. The præoperculum has no prominent ridge, or a developed muciferous cavity; its angular portion is very thin, flexible, broad, produced, with the posterior margin rounded. The operculum is twice as high as broad, and has a very obtuse posterior point, with a slight notch above. The suboperculum is elongate, and has a nearly vertical situation. The basal portion of the brain-capsule is compressed, and the basisphenoid has a very wide foramen before the occipital joint. The urohyal is distinguished by a very deep incisure in its posterior margin. Each pubic bone is formed by three lamellæ of equal extent; their entire length is less than that of the coracoid.

I find one vertebra more than stated by Valenciennes, namely eleven abdominal *vertebræ* and thirteen caudal, the length of the former portion of the vertebral column being to that of the latter as 1:1·07. The single vertebræ are rather elongate; the neural and hæmal spines narrow, except those of the first four vertebræ, which are dilated; the interneural spines are dilated, triangular, but short, and do not extend between the neural spines. The interhæmal spines are very feeble, and the first is scarcely different from the others. The ribs are slender.

2. Box salpa.

Σάλπη, *Arist:* iv. c. 8, v. c. 9, 10, vi. c. 17, viii. c. 2, 13, ix. c. 37; *Ælian*, ix. c. 7. p. 516; *Oppian*, i. p. 6; *Athen.* vii. p. 320.
Salpa, *Ovid. Hal.* v. 121; *Plin.* ix. c. 57; *Bellon.* pp. 187, 189; *Rond.* v. c. 23. p. 154; *Gesner*, pp. 832, 979; *Aldrov.* ii. c. 21. p. 189; *Willughby*, p. 316; *Ray*, p. 134.
Sparus, no. 15, *Artedi, Gen.* p. 38.
—— salpa, *Linn. Syst. Nat.* i. p. 470; *Brünn. Pisc. Mass.* p. 46; *L. Gm.* p. 1275; *Bloch*, taf. 265 (not good); *Bl. Schn.* p. 270; *Lacép.* iv. pp. 97, 101; *Risso, Ichth. Nice*, p. 243.
Cynædus, *Gronov. Zoophyl.* no. 216.
Box salpa, *Cuv. & Val.* vi. p. 357. pl. 162; *Webb & Berth. l. c.*; *Guich. l. c.*
Cynædus onias, *Gronov. Syst. ed. Gray*, p. 55.

D. $\frac{11}{15}$. A. $\frac{3}{14-15}$. L. lat. 73. L. transv. 5/14. Cæc. pylor. 4. Vert. 10/14.

Body rather compressed; caudalis forked. Greenish, with orange-coloured longitudinal bands; a black spot in and above the axil.

Mediterranean; Canary Islands; Cape Seas?

a. Adult: skin: not good state. Mediterranean. From the Collection of the Zoological Society.
b. Young. Malta. From the Haslar Collection.
c. Adult. Sicily. Presented by W. Swainson, Esq.
d. 13″ long. Madeira. From the Haslar Collection.
e. Adult: stuffed. Cape Seas. Purchased of Sir A. Smith.—Axil with a black spot; therefore not identical with *B. goreensis*.
f. Adult: bad state. From the Haslar Collection.
g. Adult: bad state.
h. Adult: stuffed.
i. Adult: skin. From Mr. Yarrell's Collection.
k. Half-grown.
l. Half-grown: stuffed: bad state. From Mr. Yarrell's Collection.
m. Large specimen: skeleton. Lanzarote. From the Rev. R. T. Lowe's Collection.
n. Intestines of specimen *m*.
o. Half-grown: skin. From Gronov's Collection.

A description of the anatomy of the soft parts has been given by Valenciennes, to which I may add, that the pyloric appendages are very elongate.

Skeleton.—The occipital crest and the two lateral crests are rather feeble and moderately elevated; the former slightly extends on the frontal bones, and the latter emit a flat free process posteriorly. The upper surface of the frontal bones is slightly convex and roughened by irregular small ridges and holes; there is no central longitudinal groove. The upper portion of the skull is broad, and therefore the turbinal bones are remote from each other; they are transformed into curved tubes. The intermaxillaries are short and strongly built; their posterior processes are nearly equal in length to the descending branch. The maxillary bone is short, bent, and very irregularly shaped; its upper portion is fitted in the angle of the intermaxillary and provided with a deep groove for the articulation with the turbinal bone,—a structure by which we are reminded of that of *Girella*;

Pimelepterus, &c. The mandibulary is stout, elevated, and short, shorter than the præorbital, and relatively much shorter than in *Box vulgaris*. The vomer has a broad and flat head, and its posterior portion compressed and narrow. The præorbital has its upper anterior portion rather produced, and its inferior edge slightly emarginate. The infraorbital ring is not much narrower than the posterior part of the præorbital, and has no interior plate. The angle of the præoperculum is regularly rounded and not produced. The operculum is quadrangular, twice as high as broad; the anterior side is the longest, the superior the shortest; it has no spine at all. The suboperculum is obliquely situated, and much narrower than the interoperculum. The basal portion of the brain-capsule is very compressed, and the basisphenoid has a wide and elongate foramen before the occipital joint. The glossohyal is very short, triangular. The urohyal not only has a very deep posterior incisure, but the lower of the two processes formed by that incisure is again deeply forked. The pubic bones are formed by three lamellæ of equal extent, as in *Box vulgaris*, but they are relatively longer, and not much shorter than the coracoid.

I find one vertebra more than stated by Valenciennes, namely ten abdominal and fourteen caudal vertebræ, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·18. The single vertebræ are strong, but not distinguished by their length. The neural and hæmal spines are narrow, remote from each other, except those of the first three vertebræ, which are dilated. The interneural spines are rather short, and do not extend very far between the neurals; those of the spinous dorsal are dilated. The interhæmal spines are very feeble; the first is stronger and longer than the others, with a short anterior ridge, and is attached to the hæmal of the eleventh vertebra. The ribs are of moderate strength, and some have epipleural spines.

The *incisors* are similar to those of *Pimelepterus*; there are nine on each side of the upper jaw, and twelve on each side of the lower. Each has a free vertical portion and a horizontal one, by which the tooth is anchylosed to the bone. The vertical portion has a shallow outer longitudinal groove, terminating in a notch at the cutting margin; the horizontal portion is compressed, and has a very deep groove for the soft parts of the tooth. The teeth are replaced from time to time by others, *which enter their place from the outside of the series*, whilst we observe, in other fishes of this family, that the teeth replacing the old ones are developed on the interior side of the cavity of the mouth. The pharyngeal teeth form broad cardiform patches, and are stronger beneath than above.

3. **Box goreensis.**

Cuv. & Val. vi. p. 364.

$$D. \tfrac{11}{15}. \quad A. \tfrac{3}{14}.$$

Very similar to *B. salpa*, but without black at the axil. (*Val.*) A rather doubtful species from Cape Verde.

3. SCATHARUS.

Scatharus, *Cuv. & Val.* vi. p. 375.

In both jaws a single series of lanceolate teeth, behind which are no other teeth; no molars. Cheeks scaly. The dorsal spines (eleven) can be received in a scaly sheath; anal spines three. Scales moderate. Six branchiostegals. Pyloric appendages in small number; air-bladder with two short posterior horns.

Mediterranean.

1. Scatharus græcus.

Cuv. & Val. vi. p. 376. pl. 162 ter; *Exped. Sc. Morée, Zool.* pl. 17. f. 2 *a, b*.

D. $\frac{11}{11}$. A. $\frac{3}{10}$. Cæc. pylor. 4.

The height of the body is one-third of the total length. Coloration uniform.

Mediterranean.

4. OBLATA.

Oblata, sp., *Cuv. Règne Anim.*; *Cuv. & Val.* vi. p. 366.

In both jaws a series of broad incisors in front, notched at the cutting margin, behind which is a band of granular teeth*; on the sides a series of small pointed teeth; no molars. Cheeks scaly. The dorsal spines (eleven) can be received in a scaly sheath; anal spines three. Scales moderate. Six branchiostegals. Pyloric appendages in small number; air-bladder with two horns posteriorly.

Mediterranean.

1. Oblata melanura.

Μελανουρος, *Arist.* viii. c. 2; *Ælian,* i. c. 41, xii. c. 17; *Oppian,* i. p. 5; *Athen.* vii. p. 313.

Melanurus, *Ovid. Hal.* v. 113; *Plin.* xxxii. c. 11; *Bellon.* pp. 270, 271; *Rondel.* v. c. 6. p. 126; *Salv.* f. 181, 182; *Aldrov.* i. c. 13. p. 64; *Gesner,* pp. 540, 638; *Willughby,* p. 310; *Ray,* p. 131.

Sparus, no. 14, *Artedi, Genera,* p. 37.

—— melanurus, *Linn. Syst. Nat.* i. p. 468; *Brünn. Pisc. Mass.* p. 41; *L. Gm.* p. 1271; *Bl. Schn.* p. 273.

—— oblada, *Lacép.* iv. p. 76; *Risso, Ichth. Nice,* p. 237.

Oblata melanura, *Cuv. & Val.* vi. p. 366. pl. 162 *b*; *Guichenot, Explor. Sc. Algér. Poiss.* p. 54.

D. $\frac{11}{14}$. A. $\frac{3}{13}$. L. lat. 65. L. transv. $\frac{7-8}{16}$. Cæc. pylor. 6. Vert. 10/14.

The lower jaw rather prominent; a large black blotch across the back of the tail, extending on the sides.

Mediterranean; Madeira; Canary Islands.

a. Adult: skin. Mediterranean. From the Collection of the Zoological Society.

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* The teeth behind the incisors are not villiform, as stated by Cuvier, but granular, as in *Crenidens*, to which genus *Oblata* is closely allied.

b. Adult. Mediterranean. Purchased of Mr. Frank.
c. Many young specimens. Malta. From the Haslar Collection.
d. Fine specimen. Madeira. From the Rev. R. T. Lowe's Collection.
e. Adult. Lanzarote. From the Rev. R. T. Lowe's Collection.
f. Adult male: skeleton. Madeira. From the Haslar Collection.
g. Adult. From Mr. Yarrell's Collection.
h, i. Half-grown: bad state.
k. Half-grown: stuffed: not good state. From Mr. Yarrell's Collection.
l. Intestines of specimen *f.*

Skeleton.—The occipital crest is very elevated, triangular, and extends anteriorly to a transverse protuberance of the frontal bones between the eyes; the lateral crests are moderately developed, and terminate posteriorly in a short free process. The frontal bones have a very rough surface with many larger and smaller pores and a broad impression in front. The intermaxillaries are moderately developed, and have the posterior processes shorter than the descending branches. The maxillary is slightly curved, and not much broader at its free extremity than at its base. The mandibula is longer than the præorbital, with a free interspace between the dentary and articular bones. The turbinal bone is transformed into a half-channel. The præorbital is porous, and tapers slightly at its posterior extremity; the other infraorbital bones form a very narrow ring, with a narrow interior plate for supporting the eyeball from beneath. The anterior portion of the vomer is flat and broad. The system of muciferous channels is more developed in this species than in *Box*: there is a præopercular channel with very distinct openings; the limbs of the præoperculum are inconspicuously striated, and the striæ do not terminate in denticulations; the inferior limb is shorter than the posterior. The operculum is $1\frac{1}{2}$ as high as broad, and irregularly quadrangular; the upper side is oblique. There is a ridge at the inside of the bone, running towards the posterior angle, and not terminating in a prominent spine. The sub- and interoperculum are very thin, and the former is situated in a very oblique direction. The basisphenoid has a very wide opening before the occipital joint, and ascends in a curve from the brain-capsule to the nasal vertebra. The glossohyal is elongate, styliform; the urohyal triangular, elevated, and without posterior notch. Each pubic bone is formed by three lamellæ of nearly equal development, as in *Box*; it is of moderate length and much shorter than the coracoid.

There are ten abdominal and fourteen caudal vertebræ, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·4. The neural and hæmal spines are slender; the longest are those belonging to the eighth vertebra to the fifteenth. The hæmal spines are much longer than the neurals. The interneurals of the spinous dorsal are dilated, and not shorter than the neurals. The first interhæmal is slender and has a narrow ridge anteriorly; it is attached to the eleventh vertebra. The ribs are moderately strong, and some of them bear epipleural spines.

The eight anterior *teeth* of the upper jaw and the ten anterior of the lower are compressed, but without horizontal process. All the lateral teeth are conical and pointed There are some granular teeth behind the incisors, irregularly arranged. The pharyngeal teeth are cardiform, the upper ones strongest.

5. CRENIDENS.

Crenidens, *Cuv. & Val.* vi. p. 377.

In both jaws one or two series of broad teeth, with the cutting margin crenulated; a band of granulated teeth behind those series; no pointed lateral teeth. Cheeks and opercles scaly. The spines of the dorsal (eleven) can be received in a groove; three anal spines; dorsal and anal fins not scaly. Scales of moderate size. Five branchiostegals. Pyloric appendages in small number; air-bladder simple.

A vegetable feeder from the eastern coasts of Africa.

1. Crenidens forskalii.

Sparus crenidens, *Forskal, Descript. Anim.* p. xv.
Crenidens forskalii, *Cuv. & Val.* vi. p. 377. pl. 162 quater; *Rüppell, N. W. Fische,* p. 120; *Peters, Wiegm. Archiv,* 1855, p. 243.

D. $\frac{11}{11}$. A. $\frac{3}{9}$. L. lat. 55. L. transv. 5/13. Cæc. pylor. 3. Vert. 10/15.

The height of the body is one-third of the total length. Three series of scales on the cheeks. Coloration uniform.

Red Sea; Coast of Mozambique.

a. Adult: stuffed. Red Sea. From Dr. Rüppell's Collection.

6. PACHYMETOPON.

A series of trenchant incisors in front of both the jaws, behind which is a band of similar teeth, but less developed, and replacing the former. No molars; no teeth on the palate. Dorsal and anal fins partly, caudal entirely hidden by scales. Dorsal without notch and with eleven spines. Scales moderate. Cheek scaly.

Hab. ——?

1. Pachymetopon grande. (Plate XXVI.)

D. $\frac{11}{11}$. A. $\frac{3}{10}$. L. lat. 88. L. transv. 11/22.

A large and convex transverse protuberance between the eyes.

Hab. ——?

a. Adult: stuffed. From the Collection of the Zoological Society.

Description of the specimen.—The form of the body describes a regular oval, the lower profile being considerably curved. The profile of the neck is strongly curved, and passes into a very prominent rounded protuberance between the eyes. The greatest height of the body is above the root of the ventrals, and one-third in the total length; the head is rather short, one-fifth of the total length, and distinguished by the convex prominence across the forehead. The width between the eyes is $2\frac{1}{5}$ in the length of the head. The snout is elevated, short, and obtuse, with the cleft of the mouth rather small, the upper maxillary reaching to the vertical from the posterior nostril. The posterior portion of the mandibula is scaly. The præorbital is rather longer than wide, and naked, like the upper part of the skull. The eye is of moderate size, and contained $4\frac{1}{5}$ in the length of the head, or $1\frac{1}{2}$ in that of the snout. The nostrils are situated before the upper angle of the orbit, and rather remote from each other; the posterior is an elongate slit, the anterior more rounded. The cheek is covered with six series of scales, but a broad marginal space of the præoperculum is scaleless; the posterior margin of the præoperculum is straight, slightly oblique; the angle is rounded and minutely serrated; the inferior margin convex, and about half as long as the posterior. The other opercles are covered with scales, without any spines or denticulations. The suprascapula is much larger than a scale, and indistinctly striated; a series of scales, similarly striated, ascends from the suprascapula to the neck.

The distance of the occiput from the *dorsal* fin nearly equals that from the end of the snout. The fin is continuous, and its soft portion is enveloped in a scaly coat to one-half of its height. Its origin falls vertically above the root of the pectoral, and its end above the sixty-third scale of the lateral line. The spines are moderate; the fifth is one of the highest, and about $2\frac{1}{5}$ in the length of the head. The soft dorsal nearly equals the same height. The distance between the caudal and dorsal fins nearly equals the height of the tail beneath the dorsal fin. The *caudal* fin is densely covered and entirely hidden by minute scales; it is emarginate, with the lobes pointed, one of the middle rays being rather less than one-half of the length of a lobe. The *anal* fin is scaly to the same extent as the soft dorsal; its origin falls vertically rather behind that of the soft portion of the dorsal; the spines are rather strong; the first is one-half of the length of the second; the second rather stronger, but not longer than the third, and about two-thirds the length of the longest dorsal spine. The rays appear to be equal to one another, and to those of the dorsal fin. The *pectoral* fin is $3\frac{2}{3}$ in the total length, and reaches to the origin of the anal; the fifth ray exceeds the others in length; the basal portion of the fin is densely covered with scales. The root of the ventral falls entirely behind that of the pectoral; the fin has a moderately strong spine, about two-thirds of the length of the adjacent ray, and reaches nearly to the vent.

The scales are of moderate size, not ciliated, higher than long; one of the largest covers one-half of the eye.

The teeth forming the outer series are triangular, broad, with pointed extremities, sixteen in the upper jaw and twenty-two in the lower. The other teeth, behind this series, are arranged in a broad band, similarly but less developed, with the cutting margin not yet pointed.

The coloration is now a uniform greyish; but the fish appears to have been red in life, with the dorsal, anal, and ventral fins blackish

	inches.	lines.
Total length	20	6
Height of the body	7	0
Length of the head	4	0
Distance between the eyes	1	10
Diameter of the eye	0	10
Length of the fifth dorsal spine	1	9
——— of the second anal spine	1	3
——— of the pectoral fin	5	6
——— of the ventral fin	3	6
——— of a scale	0	6
Height of a scale	0	8

7. DIPTERODON.

Dipterodon, *Cuv. & Val.* vii. p. 274.

A series of trenchant incisors in both jaws; no molars; no teeth on the vomer or the palatines. Cheek scaly. Minute scales cover the greater part of the soft portions of the vertical fins. Dorsal deeply notched, with ten spines, nine of which form the spinous portion; three anal spines. Præoperculum denticulated. Scales small. Six branchiostegals. Air-bladder simple.

Cape Seas.

1. Dipterodon capensis.

Coracinus, *Gronov. Zoophyl.* no. 226.
Dipterodon capensis, *Cuv. & Val.* vii. p. 276. pl. 188.
Coracinus aper, *Gronov. Syst. ed. Gray*, p. 57.

D. $9 \left| \frac{1}{17\text{–}18} \right.$. A. $\frac{3}{13\text{–}14}$. L. lat. 75. Vert. 10/15.

The height of the body is $2\frac{2}{3}$ in the total length. Uniform dark brown.

Cape Seas.

a. Adult: stuffed. Cape Seas. Procured from Sir A. Smith.
b. Adult.
c. Half-grown: stuffed. Cape Seas. Procured from Sir A. Smith.
d. Adult: skin. From Gronov's Collection.

8. PROTERACANTHUS.

Crenidens (Girella), sp., *Cant. Catal.* p. 52.

In both jaws one or two series of flat tricuspid teeth, behind which is a band of similar teeth, replacing the former. No molars. Cheeks and opercles scaly. A recumbent spine before the dorsal;

ten dorsal and three anal spines; the soft portions of the dorsal and anal scaly at the base. Scales of moderate size. Five branchiostegals.

Sea of Pinang; Malayan Peninsula.

1. Proteracanthus sarissophorus.

Crenidens sarissophorus, *Cant. Catal.* p. 52. pl. 1.
Girella sarissophorus, *Bleek. Singap.* pp. 63, 64.

D. $\frac{10}{15}$. A. $\frac{3}{14}$.

The height of the body is 2$\frac{3}{4}$ in the total length; caudal truncated; the fourth dorsal spine (the recumbent spine not included) very strong and elongate, overlapping the succeeding five spines; the first ventral ray produced into a filament. Coloration uniform brownish. (*Cant.*)

Sea of Pinang; Malayan Peninsula.

9. GIRELLA*

Girella, *Gray, Illustr. Ind. Zool.*
Melanichthys, *Temm. & Schleg. Faun. Japon. Poiss.* p. 75.
Crenidens, sp., *Richardson.*

In both jaws series of flat and generally tricuspid teeth, behind which is a band of similar teeth, but less developed, and replacing the former. No molars; [in one species a short series of palatine teeth.] Cheeks scaly; opercles naked, except the upper angle of the operculum. The dorsal spines (fourteen or fifteen) can be received into a rather incomplete groove. Scales of moderate size. Six branchiostegals. Pyloric appendages in great number; air-bladder divided into two posterior horns.

Chinese, Japanese, and Australian Seas.

1. Girella punctata.

Girella punctata, *Gray, Ill. Ind. Zool.* pl. 98. f. 3, 4.
Melanichthys, *Temm. & Schleg. Faun. Japon. Poiss.* p. 75. pl. 39.
Crenidens punctatus, *Richardson, Ichth. China,* p. 242.
—— melanichthys, *Richardson, Ichth. China,* p. 243.

D. $\frac{14-15}{13-14}$. A. $\frac{3}{12-13}$. L. lat. 52–66. L. transv. $\frac{7-9}{17-21}$.

The length of the head is about 4$\frac{1}{2}$ in the total length; dorsal fin of moderate height, the longest ray rather longer than the last spine; the incisors three-pointed, moderately broad, imbricate, the upper in three, the lower in two series. Uniform brownish.

Chinese and Japanese Seas.

a. 9″ long: skin. China Seas. Purchased of Mr. Warwick.
b. 14″ long: stuffed. China. Presented by J. R. Reeves, Esq. —Type of *Girella punctata*: rather deformed by stuffing.
c–f. Adult: stuffed. Japan. Purchased of Mr. Frank.

* 1. Crenidens leoninus, *Richardson, Ichth. China,* p. 242.—China Seas

2. Girella tricuspidata.

Box tricuspidatus, *Quoy & Gaim. Voy. Freyc. Zool.* p. 296.
Oblata tricuspidata, *Cuv. & Val.* vi. p. 372.
Crenidens triglyphus, *Richardson, Voy. Ereb. & Terr., Fishes,* p. 36. pl. 25. f. 2.

D. $\frac{15}{11-12}$. A. $\frac{3}{11-12}$. L. lat. 50. L. transv. 10/20*. Vert. 11/16.

The length of the head is $4\frac{2}{3}$ in the total length; dorsal fin moderately high, the spinous portion lower than the soft; the incisors three-pointed, moderately broad, imbricate, in several series in the upper, in two in the lower jaw. Uniform brownish.

Australian Seas.

a. Adult: bad state. Sydney. From the Haslar Collection.
b. Thirteen inches long: stuffed. Australia. Purchased of Mr. Warwick.
c. Young. Australia. Purchased of Mr. Gould.
d–g. Half-grown. From the Haslar Collection.
h. Skeleton. From the Haslar Collection.
i. Half-grown: bad state. From the Haslar Collection.
k. Intestines of specimen *h.*

The *peritoneum* is of an intensely black colour; the *stomach* horseshoe-like bent; the pyloric appendages are exceedingly numerous, thin, and many of them bifid or trifid; the *intestines* make five complete convolutions, and are $1\frac{2}{3}$ as long as the whole fish; the *air-bladder* is posteriorly divided into two large horns, situated between the muscles of the tail and the hæmal spines belonging to the anal fin.

Skeleton.—The occipital crest is elevated, triangular, and does not extend on the frontal bones. The frontal bones are broad, and furnished with two low elongate protuberances, which diverge between the eyes, each terminating in two crests, lateral to that of the occipital, and moderately developed; the nasal (ethmoid) bone is not concealed by the frontal bones, and projects considerably before them. The anterior portion of the intermaxillaries is strong and thick; their posterior processes equal in length the descending branches. The maxillary is feeble, with a broad free extremity. The mandibula is short, elevated, and about as long as the præorbital. The head of the vomer is triangular and slightly excavated. The turbinal bone is very elongate and tubiform, the præorbital rhombic, the suborbital arch narrow, with a broad interior plate for supporting the eyeball from beneath. The horizontal limb of the præoperculum is much shorter than the vertical; both are minutely serrated; the angle rounded; there are small openings from the muciferous channel of the bone. The operculum is $1\frac{1}{2}$ as high as wide, quadrangular, with the upper side horizontal, and the posterior slightly emarginate; it is provided at its inner surface with a bony oblique ridge, terminating in a free prominent spine. The sub-

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* The series of small scales on the back and on the belly are included in these numbers.

and interoperculum are obliquely situated; the former tapers posteriorly, and is produced into an elongate point. The basal portion of the brain-capsule is not compressed; the basisphenoid has a narrow opening before the occipital joint. The urohyal is elevated, triangular, with the posterior side emarginate. Each pubic bone is formed by three lamellæ, the inferior of which is the broadest, and the two exterior ones strongest; it is elongate, and nearly as long as the coracoid.

There are eleven abdominal and sixteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·4. The single vertebræ are rather short. The first interhæmal spine is of moderate strength, and evidently composed of two. Some of the ribs have epipleural spines.

3. **Girella simplex.**

Crenidens simplex, *Richardson, Voy. Erebus & Terror, Fishes*, p. 25.

D. $\frac{15-14}{12-13}$. A. $\frac{3}{12}$. L. lat. 55. L. transv. 11/20.

The length of the head is one-fifth of the total length; dorsal fin of moderate height, the spinous portion about as high as the soft; the incisors with the cutting margin entire, moderately broad, imbricate, above and below in two or three irregular series. Uniform brownish (in a dried state).

Australian Seas.

a. Adult. Sydney. Purchased of Mr. Brandt.
b. Adult: stuffed. Port Jackson. Purchased of Mr. Gould. Type of the species.
c. Adult: stuffed. Moore's Bay. Purchased of Mr. Warwick.

This species is distinguished by a short series of teeth on the anterior portion of the palatine bones.

4. **Girella zonata.** (Plate XXVII.)

D. $\frac{14}{14}$. A. $\frac{3}{11}$. L. lat. 49. L. transv. 9/17.

In both jaws a pluriserial band of narrow tricuspid teeth, separated from a posterior band of similar teeth, which are less developed, by a groove. Brown (in spirits), with a vertical lighter zone across the middle of the body; the vertical fins and the ventrals blackish.

Australian Seas?

a. Fine specimen. From the Haslar Collection.

Description of the specimen.—The anterior part of the trunk is slightly elevated, its greatest height being above the base of the ventral fins, where it is one-third of the total length. The head is rather short and thick, the distance between the eyes being one-third of the length of the head, which is $4\frac{1}{3}$ in the total. The snout is obtuse and broad; the upper maxillary (which, when the mouth is closed, is entirely hidden) reaches to the vertical from the anterior margin of the eye. The præorbital is higher than long, and entirely scaleless. The eye is situated near the upper profile of the head, without interfering with it; it is of moderate size, its diameter being $4\frac{3}{5}$ in the length of the head. The cheeks are covered with very small scales extending nearly to the præopercular margin, which exhibits some minute serrature at the angle. The operculum is scaly on its upper angle only; the remainder is naked, like the sub- and interoperculum. The suboperculum is narrow, and tapers very much posteriorly; its lower margin is nearly straight; the interoperculum is broader and crescent-shaped. The suprascapula is not visible externally.

The *dorsal* fin begins vertically above the root of the pectorals, and ends in the vertical from the 38th scale of the lateral line. Streaks of minute scales ascend between the spines and rays to about one-half of the height of the fin. The spines are of moderate size; they gradually become longer to the sixth, the seventh to the fourteenth being nearly equal in length, about $2\frac{1}{3}$ in the length of the head; the anterior rays are rather more elevated, but the posterior ones decrease again, and the last is about one-third of the length of the head. The distance between the dorsal and caudal fins exactly equals that between the end of the snout and the præopercular margin, or the depth of the tail beneath the end of the dorsal. The *caudal* fin is nearly scaleless, emarginate, with acute lobes; one of the middle rays is about two-thirds of the upper lobe. The *anal* fin begins a little behind the soft portion of the dorsal, and ends a little before it; its base is scaly, and streaks of minute scales extend on between the rays to about one-third of the depth of the fin; the lower margin is very convex. The spines are rather strong; the first is one-half the length of the second; the second three-quarters of the third, the free portion of which is $2\frac{1}{2}$ in the length of the head; the following rays become longer to the fourth, fifth, and sixth, which are about two-thirds of the length of the head; and the last ray is one-half only of the sixth. The *pectoral* fins are scaly in their basal third; they have a rounded posterior margin, and are of moderate length, not extending to the vent. The root of the *ventrals* is placed at some distance behind the vertical from the base of the pectorals; they extend to the vent, and are composed of one spine and five rays, the former of which is about one-half the length of the first ray. There is no elongate scale at the base of these fins.

The *scales* are distinctly ciliated, and rather longer than high, their basal portion being much larger than the free. Many beautifully arranged fine streaks radiate from the centre to the basal margin. One of the largest covers one-half of the eye.

Both jaws are furnished in front with a transverse band of delicate, tricuspid, narrow teeth, arranged in three or four series. Another (posterior) band of teeth is separated from the former by a groove; this band contains teeth, by which the anterior ones may be replaced; they are therefore in a less developed condition, having rather the appearance of setiform or villiform teeth, with the notches at the cutting margin scarcely visible. There are no palatine teeth whatever.

The *colour* is now a dark nut-brown, with a lighter vertical band, descending from the middle of the spinous dorsal to the belly, and occupying three series of scales. The dorsal, anal, and ventral fins are blackish.

	inches.	lines.
Total length	8	4
Height of the body	2	10
Length of the head	1	11
Distance between the eyes	0	8
Diameter of the eye	0	5
Length of the sixth dorsal spine	0	10
——— of a caudal lobe	2	0
——— of the third anal spine	0	9
——— of the fifth anal ray	1	4
——— of the eleventh anal ray	0	7
——— of the pectoral	1	7
——— of the ventral	1	5
——— of a scale	0	$3\frac{1}{3}$
Height of a scale	0	3

10. DOYDIXODON.

Doydixodon, *Valenc. in Voy. Vénus*, v. p. 318.

In both jaws series of flat teeth, behind which is a band of similar teeth, less developed and replacing the former. No molars; no teeth on the palate. Cheeks scaly; opercles naked. Dorsal and anal fins scaly at the base; twelve dorsal spines; the soft portions elevated. Scales of moderate size. Five branchiostegals.

Galapagos Archipelago.

1. Doydixodon freminvillei.

Valenc. l. c. p. 323. pl. 5.

D. $\frac{12^{*}}{20}$. A. $\frac{3^{*}}{15}$. L. lat. 40–45.

Uniform brownish.

Galapagos Archipelago.

11. TEPHRÆOPS.

Crenidens, sp., *Richards. Voy. Ereb. & Terr., Fishes,* p. 69.

In both jaws series of flat, tricuspid teeth, behind which is a band of similar teeth, less developed and replacing the former. No molars. Cheeks scaly; opercles naked, except the upper angle of the operculum. Fourteen dorsal spines. Scales very small.

Australian Seas.

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* The figure does not agree with these numbers.

1. Tephræops richardsoni.

Crenidens tephræops, *Richards. Voy. Ereb. & Terr., Fishes,* p. 69. pl. 41. f. 1.

D. $\frac{14}{13}$. A. $\frac{3}{11}$.

In front of the jaws a single series of tricuspid teeth, separated from the broad posterior band of smaller ones by a groove; anal fin rather elevated, the second ray being four-fifths of the length of the head. Uniform blackish.

King George's Sound.

a. Eleven inches long: stuffed. King George's Sound.—Type of the species.

2. Tephræops zebra.

Crenidens zebra, *Richards. l. c.* p. 70.

Nine blackish-brown bars descending from the back.

Known from a drawing only.

King George's Sound.

12. GYMNOCROTAPHUS*.

In both jaws a series of broad, lanceolate incisors, behind which is a band of cardiform teeth. No molars. Cheeks naked. Opercles scaly. Six branchiostegals. Ten dorsal spines. The vertical fins partly covered with scales. Scales of moderate size.

Cape Seas.

1. Gymnocrotaphus curvidens. (Plate XXII.)

B. 6. D. $\frac{10}{12}$. A. $\frac{3}{10}$. L. lat. 65. L. transv. 6/18.

The height of the body is about one-third of the total length.

Cape Seas.

a. Thirteen inches long: stuffed. Cape Seas. Presented by Sir A. Smith.

Description of the specimen.—The fish is somewhat similar to *Cantharus* in general appearance. The body is rather elevated, its greatest height above the ventrals being nearly one-third of the total length. The length of the head is one-fourth of the total. The space between the eyes is rather convex and broad, its width being $2\frac{3}{5}$ in the length of the head. All the snout, the cheek, and the præoperculum are completely naked, and the scales of the neck do not extend on between the eyes. The snout is of moderate length. The eye is situated high up the sides, and its diameter is $5\frac{1}{5}$ in the length of the head. The nostrils are before the upper angle of the eye and rather remote from each other; the præorbital is a little higher than long. The angle of the præoperculum is rounded; its limbs are directed towards each other at a rather obtuse angle; it has no denticulations whatever. The other opercles are entirely covered with scales, and have no armature. The suprascapula is very large, and there is a series of similar scales between it and the nape of the neck.

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* From γυμνὸς naked, and κρόταφος cheek.

The distance of the occiput from the origin of the *dorsal* fin is much less than from the end of the snout; the former falls vertically above the root of the ventrals, and its end above the forty-sixth scale of the lateral line. The last two spines and the soft dorsal are enveloped in scales, which ascend to one-half the height of the fin. The spines are of moderate strength and rather short; the first is the shortest, whilst the third to the last are nearly equal and 3¾ in the length of the head. The soft dorsal is higher, quadrangular. The distance between the dorsal and caudal fins is much less than the depth of the tail beneath the end of the dorsal fin. The greater part of the *caudal* is covered with small scales; it is slightly emarginate, with rounded lobes. The *anal* fin is opposite to the soft dorsal, to which it is very similar, though somewhat lower. The spines are not stronger than those of the dorsal; the third is the longest, rather shorter than the longest dorsal spine or than the first anal ray. The *pectoral* is pointed, and one-fourth of the total length; the portion nearest to the base is scaly. The base of the *ventrals* falls behind that of the pectorals; their length is 6⅘ in the total; the spine is of moderate strength, and three-fifths of the length of the adjacent ray.

The *scales* are of moderate size, minutely ciliated, higher than long; one of the largest covers rather more than one-half of the orbit.

There is a series of broad, lanceolate, curved *incisors* in each of the jaws—in the upper one twelve, in the lower fourteen; there is also a broad band of cardiform teeth behind these incisors. Neither the vomer nor the palatine bones appear to have any teeth.

Colour uniform brownish grey (in a dried state).

	inches.	lines.
Total length	13	0
Height of the body	4	6
Length of the head	3	3
Diameter of the eye	0	7½
Distance between the eyes	1	3
Length of the fourth dorsal spine	0	10½
——— of the pectoral	3	3
——— of the ventral	1	10½
——— of a scale	0	4½
Height of a scale	0	6

Second Group. HAPLODACTYLINA.

Sparidæ with cutting teeth in front; no molars; the lower pectoral rays simple, not branched.

One genus.

13. HAPLODACTYLUS.

Aplodactylus, *Cuv. & Val.* viii. p. 476.

In both jaws series of flat and generally tricuspid teeth, behind which is a band of small cardiform teeth; no molars; vomerine teeth. Cheeks and opercles scaly. Two elongate dorsal fins, the first with fifteen or sixteen spines; anal short; the lower pectoral rays simple. Scales very small. Six or five branchiostegals. Pyloric appendages in small number; air-bladder simple.

Western coasts of South America; Port Arthur (Australia).

Vegetable feeders.

1. Haplodactylus punctatus.

Aplodactylus punctatus, *Cuv. & Val.* viii. p. 477. pl. 242; *Jenyns, Zool. of the Beagle, Fishes*, p. 15; *Gay, Hist. Chil. Zool.* ii. p. 156.

Aplodactylus reginæ, (*Valenc.*) *Gay, Hist. Chil. Zool.* ii. p. 158. lam. 1. fig. 2.

D. 16 | 21. A. $\frac{3}{8}$. Cæc. pylor. 2.

Incisors tricuspid; six simple pectoral rays. Brownish red, dotted all over with black.

Coasts of Chile.

a. Fine specimen. S. America. From Mr. Bridges' Collection.

2. Haplodactylus vermiculatus.

Gay, Hist. Chil. Zool. ii. p. 159. lam. 1. f. 1.

D. 15 | $\frac{1}{20}$. A. $\frac{3}{8}$.

Incisors tricuspid. Brownish grey, lighter beneath, vermiculated with brown; fins brown-spotted. (*Gay.*)

Sea of Valparaiso.

3. Haplodactylus guttatus.

Gay, l. c. p. 160.

D. 15 | $\frac{1}{19-20}$. A. $\frac{3}{7}$.

Yellowish, dotted all over with white. (*Gay.*)

Coast of Chile.

4. Haplodactylus arctidens.

Richards. Proc. Zool. Soc. 1839, p. 96, and *Trans. Zool. Soc.* iii. p. 81.

D. $16 \mid \frac{1}{18}$. A $\frac{3}{7}$. Cæc. pylor. 4. Vert. 16/18 (?).

Incisors lanceolate, without distinct lobes in old age. Six simple pectoral rays. Uniform brownish.

a. Twenty-three inches long: stuffed. Port Arthur. Presented by Sir J. Richardson.—Type of the species.

5. Haplodactylus lophodon. (PLATE XXIII. fig. B.)

B. 5. D. 17 | 20. A. $\frac{3}{6}$. L. lat. 78

Each incisor with a terminal lobe and two lateral lobes (on each side). Six simple pectoral rays. Brown: operculum with a black spot behind; caudal and anal variegated with lighter.

Coast of New South Wales.

a. Adult. Sydney. Presented by the College of Surgeons.
b. Young. New South Wales. Presented by Dr. G. Bennett.

Description of the specimen.—The greatest height of the body is $3\frac{3}{5}$ in the total length, and is below the sixth dorsal spine; the upper profile of the head and the nape of the neck is rather concave. The head is small, its length being one-fifth of the total; its upper surface between the orbits is flat. The snout is obtuse and rounded, not longer than the diameter of the eye, which is more than the distance between the eyes, and one-fourth of the length of the head. The cleft of the mouth is narrow, horizontal, situated at the lower part of the snout, which considerably projects above it; the mouth is very little protractile, and the upper maxillary does not reach to the anterior margin of the orbit. The nostrils are rather remote from each other, and the anterior is furnished with a short membranaceous appendage. The limbs of the præoperculum are flexible and skinny, and meet at a rounded angle; the operculum terminates posteriorly in a point, separated from another shorter one by a deep semicircular notch; the sub- and interoperculum are narrow. The opercles and cheeks are covered with minute scales, the other parts of the head being naked.

The *dorsal* fin begins in the vertical from the extremity of the operculum; the spinous portion has the upper margin convex, and is continued by the soft one, although the latter is considerably elevated above the posterior spines; its upper margin is nearly straight, obliquely descending. The first spine is one-half the length of the second, the second one-half of the third; the following increase in length to the sixth, which is nearly one-half of the length of the head. The posterior spines gradually become shorter to the sixteenth and seventeenth, which are equal in length to each other and to the second spine. The second and third rays are the longest, rather longer than the sixth spine, the following gradually becoming shorter. There is a pad along all the base of the fin, covered with small scales and hiding the basal portion of the fin. The distance between the dorsal and caudal fins is 8¾ in the total length, and much more than the height of the tail below the extremity of the dorsal. The *caudal* fin is slightly emarginate, with the lobes rather rounded; its length is nearly one-sixth of the total. Stripes of minute and transparent scales extend over the greater half of the interspaces between the rays. The *anal* is very short, the length of its base being 2½ in its distance from the caudal; its origin falls vertically below the second dorsal ray, and its end below the eleventh. The first spine is one-half the length of the second, the second is one-half of the third, the third two-thirds of the second and third rays, which are the longest, and about 1⅓ in the length of the head; the base of the fin is scaly. The *pectoral* fin is rounded, and equals the head in length. The six lower rays are simple, not distinguished from the others in length or in thickness. The *ventrals* are shorter and do not reach to the vent; they are inserted below the middle of the pectoral: their spine is two-thirds of the total length of the fin.

The *scales* are small, longer than high, not ciliated at their outer margin; one of the largest covers one-fifth of the eye.

The *teeth* are placed in a band in the upper jaw and in a single series in the lower; they are compressed and rather elongate, with a lobe at the extremity and with two on each side. There are no vomerine or palatine teeth.

The *ground-colour* is brown; body and tail with indistinct and interrupted darker longitudinal stripes; a darker vertical spot below the eye; the notch of the operculum black, white-edged anteriorly; the pectoral and ventral fins are blackish, the caudal and anal fins variegated with lighter.

	inches.	lines.
Total length	5	10
Length of the head	1	2
Height of the body	1	7
Diameter of the eye	0	3½
Length of the sixth dorsal spine	0	6½
Interspace between dorsal and caudal fins	0	8
Length of a caudal lobe	1	0
——— of the second anal ray	0	11
——— of the pectoral	1	2
——— of the ventral	0	11½
——— of a scale	1	1⅔
Height of a scale	0	1⅓

Third Group. SARGINA.

Sparidæ with cutting teeth in front of the jaws and molars on the sides.

Synopsis of the Genera.

Molar teeth in several series	14. Sargus.
Molar teeth in a single series	15. Charax.

14. SARGUS*.

Sargus, (*Klein*) *Cuv. Règne Anim.*; *Cuv. & Val.* vi. p. 9.

A single front-row of cutting teeth and several side-rows of rounded molar teeth in both the jaws. Cheeks scaly. The spines of the dorsal (ten to thirteen) may be received in a groove; three anal spines. Opercles not armed. Scales of moderate size. Five or six branchiostegals. Pyloric appendages in small number; air-bladder sometimes notched anteriorly and posteriorly.

Mediterranean; warmer parts of the Atlantic; shores of the United States; eastern shores of Africa.

1. Sargus vulgaris.

Sargus, *Gesner, Aquat.* p. 825; *Aldrov.* pp. 174, 176; *Salvian.* f. 179; *Bellon.* p. 244.
Sparus sargus, *Brünn.* p. 38. no. 52.
—— puntazzo, *Risso, Eur. Mérid.* iii. p. 352.
Sargus vulgaris, *Geoffr. Descr. Eg.* pl. 18. f. 2.
—— salviani, *Cuv. & Val.* vi. p. 28; *Guichenot, Explor. Sc. Algér. Poiss.* p. 47; *Webb & Berthelot, Hist. Nat. Iles Canar., Poiss.* p. 28.

D. $\frac{11-12}{15-14}$. A. $\frac{3}{14}$. L. lat. 55. L. transv. 6/14. Cæc. pylor. 4. Vert. 10/14.

Incisors moderately broad, implanted obliquely. The molars of the upper jaw form two distinct series only. The diameter of the eye is four times or $4\frac{1}{2}$ in the length of the head, $1\frac{1}{2}$ or $1\frac{2}{3}$ in that of the snout, and $1\frac{1}{2}$ in the distance between the eyes. The crown of the head is slightly convex, and there is a small protuberance above the upper anterior angle of the orbit. The præorbital is broad, and covers entirely the maxillary bone. The pectoral fins extend to, or slightly beyond, the origin of the soft portion of the anal fin, and the ventrals to the vent; the second anal spine is rather longer, but not stronger, than the third, and $3\frac{1}{3}$ in the length of the head. Golden olive-yellow, sometimes silvery, with narrow, slightly wavy, golden-yellow longitudinal stripes: a broad black band from the nape to the shoulder and axil; a broad black blotch across the back of the tail.

Mediterranean.

a. Adult: skin: not good state. Mediterranean. From the Collection of the Zoological Society.
b–e. Young and half-grown. Malta. From the Haslar Collection.
f. Half-grown: skin. Malta. From Mr. Yarrell's Collection.
g, h. Very fine specimens. Lanzarote. Presented by the Rev. R. T. Lowe.
i, k. Adult: stuffed. Santa Cruz (Teneriffe).
l. Adult. Madeira. From the Haslar Collection.
m. Adult: bad state. Purchased of Mr. Frank.
n, o. Half-grown: bad state. From the Haslar Collection.
p. Adult: not good state: stuffed.

There is a specimen in the British Museum which so remarkably differs in the number of the fins, that I considered it as the type of a new species for a long while, to which I intended to give the name of *Sargus auricularis*; but having this single specimen only, I prefer to give a full description of it, as after all it may prove to be merely an accidental variety.

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* 1. Sargus ascensionis, *Cuv. & Val.* vi. p. 61.—Ascension.

q. Adult. From the Haslar Collection.

D. $\frac{13}{12}$. A. $\frac{3}{13}$. L. lat. 56. L. transv. 6/14.

Description of the specimen.—The body is rather elevated, its greatest depth, below the fifth dorsal spine, being $2\frac{4}{5}$ in the total length. The profile of the nape forms a not very strong curve, and is continued into that of the head, which descends to the snout in a straight line; the distance between the occiput and the end of the snout equals that between the occiput and the origin of the dorsal fin. The head is compressed, and forms one-fourth of the total length; the distance between the eyes is one-third of the length of the head. The snout is rather pointed and of moderate length, the upper maxillary reaching nearly to the vertical from the anterior margin of the orbit. The præorbital is $1\frac{1}{2}$ as long as high, and covers entirely the maxillary bone. The eye is of moderate size, and situated much nearer to the upper vertical than to the inferior limb of the præoperculum. The nostrils are placed near the upper angle of the orbit; the posterior is an elongate slit, the anterior is round. There are four series of scales between the præorbital and the limb of the præoperculum, which also is partly covered with a single series of deciduous scales. The posterior margin of the præoperculum descends forwards in a straight and slightly oblique line; the angle is rounded; the inferior margin straight and oblique. The operculum has no distinct spine, and is covered with scales, like the sub- and interoperculum. The suprascapula is scale-like, without striæ or denticulations; but there is a curved series of scales, ascending from the suprascapula to the nape, which exhibit very distinct striæ.

The *dorsal* fin begins above the root of the ventrals and extends to the vertical from the forty-first scale of the lateral line, its distance from the caudal fin being $2\frac{1}{4}$ in the length of the head. The spines are rather strong, compressed, and broader on one side; the first is one-half the length of the second; the fourth, fifth, and sixth are longest, and $2\frac{1}{2}$ in the length of the head; the following gradually decrease in length to the last, which is $3\frac{3}{5}$ in the length of the head. The soft rays are nearly equal in length to one another and to the last spine. The *caudal* fin is forked, one of the middle rays being nearly one-third the length of the upper lobe, which is rather longer than the lower. The origin of the *anal* fin falls vertically below the end of the spinous dorsal, and its end immediately behind that of the soft dorsal; it is rather higher than the opposite fin, the posterior rays, however, gradually becoming shorter. The spines are rather stout; the first is two-fifths the length of the second, the second slightly exceeds the third, and is one-third of the length of the head. The sixth *pectoral* ray is longest, reaching to the origin of the soft anal. The base of the *ventrals* falls entirely behind that of the pectorals; they are of moderate length and reaching nearly to the vent; the spine is three-quarters of the length of the adjacent ray. There is an elongate pointed scale inserted at the base of the ventral.

The *scales* are minutely ciliated, higher than wide; one of the largest covers one-third of the eye.

The *incisors* are moderately broad, little narrower than in *S. rondeletii*; they are obliquely implanted, eight in each of the jaws. The molars are arranged in two series; but there are several intercalated between the two series of the upper jaw, giving the appearance of a third series; the postorior ones of the inner series are the largest.

The fish is silvery, with a blackish band from the nape across the shoulder and the posterior edge of the gill-opening; another broad blackish band on the tail, behind the dorsal; the axil and the ventral fins are blackish, the latter with a narrow white outer edge.

	inches.	lines.
Total length	8	11
Height of the body	3	2
Length of the head	2	3
Distance between the eyes	0	8½
——— between the dorsal and caudal fins	1	0
Diameter of the eye	0	7½
Length of the fifth dorsal spine	0	11
——— of the thirteenth dorsal spine	0	7½
——— of the pectoral	2	7
——— of the ventral	1	5
——— of the second anal spine	0	9
——— of a scale	0	3½
Height of a scale	0	4½

Skeleton.—The jaw-bones, armed with several series of broad molar teeth, are of a stronger and more solid structure than in any other fish of the preceding families. The intermaxillaries have their posterior processes rather elongate, the groove in which they move extending to the vertical from the anterior margin of the orbit. The portions for the incisors and for the posterior molars are slightly swollen and separated from each other by a slight notch. The maxillary has the lower extremity bent forwards to support the functions of the intermaxillary, by which it is received in a groove. This structure is widely different from that of the fishes of the preceding families, where both the bones are very loosely connected with each other; only some species of *Dentex* approach to it. The maxillary is pierced by an opening above the middle. The mandibulary is short, elevated, and thick; there is no free space between the articular and dentary bones; its muciferous channels are very rudimentary, with small openings. The head of the vomer forms a semicircular plate, its posterior portion being very narrow, with a small groove behind the head. The lower limb of the præoperculum is one-third shorter than the posterior; both meet at a rather obtuse angle, which, however, is rounded. The interior ridge is strong, rounded, not prominent, with a narrow muciferous channel behind. The operculum is irregularly quadrangular, half as wide as high, with the posterior and superior sides shortest and very slightly emarginate. There is a ridge on its inner surface, obliquely descending downwards. The interoperculum is longer and broader than the suboperculum. The turbinal bone is elongate and rather widened posteriorly; the præorbital rhombic, with the anterior margin membranaceous and much wider than the remainder of the infraorbital ring. There is a bony plate at the inner side to support the eyeball from beneath. The frontal bones, between the orbits, are slightly convex, with several low ridges and pores, radiating from the anterior extremity of the occipital crest. The occipital crest is very high, strong, triangular, with the upper margin slightly convex, and extends to above the centre of the orbit. The lateral crests also are well developed, though very much lower than the median one. The basal portion of the brain-capsule is compressed, the basioccipital having a very wide quadrangular foramen behind the occipital joint. The large free space between the coracoid and radius is triangular, widest above, and not twice as long as broad. Each of the pubic bones is formed by three lamellæ of nearly equal development.

There are ten abdominal and fourteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·4. There are three spurious interneural spines, each with a small process above, directed forwards, as in many Acanthopterygian fishes; the process of the first is rather longer than the others. The first interhæmal has an anterior ridge, and is strong and elongate, its length equalling that of the second vertebra to the eighth.

There are eight rather narrow *incisors* in both the jaws, with a group of granular teeth behind. The immature teeth, destined to replace those which are in use, make their appearance on the outer side of the bone. The molars are arranged in two series in both the jaws; sometimes several smaller ones extend further backwards at the inner side of these series, and give the appearance of a third.

2. Sargus rondeletii.

Σάργος, *Aristot.* viii. c. 2, ix. c. 5; *Ælian*, i. c. 23, 26, xiii. c. 2; *Oppian*, iv. 599, 308–403; *Athen.* vii. 313, 321.

Sargus, *Ovid. Hal.* v. 106; *Plin.* ix. c. 17, 51, 59; *Bellon. Aquat.* p. 242; *Rondel.* v. c. 5. p. 122; *Salv.* f. 178; *Gesn. Aquat.* p. 828; *Gronov. Zoophyl.* p. 63. no. 219.

Sparus sargus, *L. Gm.* p. 1270; *Bl.* taf. 264; *Bl. Schn.* p. 270; *Lacép.* iv. pp. 27, 77; *Risso, Ichth. Nice*, p. 236.

—— variegatus, (*Bonnat.*) *Lacép.* iv. p. 107.

Sargus raucus, *Geoffr. Descr. Eg. Poiss.* pl. 18. f. 1.

—— rondeletii, *Cuv. & Val.* vi. p. 14. pl. 141; *Guichenot, Explor. Sc. Algér. Poiss.* p. 46; *Webb & Berthel. Hist. Nat. Iles Canar. Poiss.* p. 28.

D. $\frac{11-12}{12-15}$. A. $\frac{3}{13-14}$. L. lat. 65. L. transv. 8/16. Cæc. pylor. 5. Vert. 10/14.

Incisors rather broad, implanted obliquely. Three series of molars above, two beneath. The diameter of the eye is $4\frac{1}{3}$ in the length of the head and $1\frac{1}{2}$ in that of the snout, which equals the distance between the eyes; the crown of the head is convex, and there is a protuberance above the upper anterior angle of the orbit; the præorbital does not entirely cover the maxillary bone. The pectoal fins extend to the origin of the anal, and the ventrals nearly to the vent. The second anal spine is rather stronger and longer than the third, and $3\frac{1}{3}$ (in younger individuals $2\frac{3}{4}$) in the length of the head. Silvery or shining golden, with numerous narrow longitudinal dusky stripes (8 or 9 above and 15 or 16 below the lateral line), and with four or five narrow blackish cross-bands, the first between the origin of the dorsal and the axil; a broad black cross-band on the back of the tail.

Mediterranean; Canary Islands; Madeira.

a. Fine specimen. Madeira. From the Haslar Collection.
b. Fine specimen. Madeira. Presented by the Rev. R. T. Lowe.
c. Fine specimen. Madeira. Purchased of Mr. Stevens.
d. Adult: skeleton. Lanzarote. Presented by the Rev. R. T. Lowe.
e, f. Adult: stuffed. Santa Cruz (Teneriffe). Presented by J. Gould, Esq.
g. Adult: stuffed. Santa Cruz (Teneriffe).
h. Adult: stuffed. Lisbon. Presented by G. Hough, Esq.
i. Adult: skin. From Mr. Yarrell's Collection.
k, l. Half-grown: bad state. From the Haslar Collection.

Skeleton.—The skeleton is very similar to that of the preceding species; there are, however, the following differences. The foramen of the maxillary is much smaller, and situated more towards the upper extremity of the bone. The occipital crest has the upper margin straight. The large free space between the coracoid and the radius is triangular and elongate, three times as long as broad. There are ten abdominal and fourteen caudal vertebræ, the length of the former portion of the vertebral column being to that of the caudal as 1 : 1·24. Valenciennes attributes nine abdominal vertebræ to this and the preceding species,—I have found ten in both. Further, he says, "le premier interépineux porte à sa partie supérieure une épine osseuse, courte, mais très-grosse, dont la pointe est dirigée vers la tête du poisson; en avant de cet interépineux en sont trois sans rayons." This is incorrect; the first true interneural has no spine directed forwards, but that spine belongs to the third spurious interneural (*i. e.* to the third interneural without corresponding dermoneural). But, in fact, all the three spurious interneurals have such a spine directed forwards, as usual in this Order of fishes. The first interhæmal is strong and very elongate, equal to the length of the second vertebra to the ninth.

There are eight rather broad *incisors* in both the jaws, with a group of granular teeth behind. The molars are arranged in three series above, and in two below; sometimes some smaller teeth extend from that group along the inner side of the constant series, giving the appearance of a fourth (or third in the lower jaw) additional one. The pharyngeal teeth are cardiform, and the upper ones are slightly compressed, terminating in a small curved hook.

3. Sargus capensis.

Smith, Illustr. Zool. S. Afr. Fishes, pl. 23. f. 2.

D. $\frac{12}{14-16}$. A. $\frac{3}{14-15}$. L. lat. 72. L. transv. 8/15.

Incisors moderately broad, implanted obliquely; three series of molars in the upper jaw, two in the lower. Head rather small, its length being $4\frac{3}{4}$ in the total length; the distance between the origin of the dorsal fin and the occiput is much more than that between the occiput and the snout. The diameter of the eye is one-fourth of the length of the head, less than the distance between the eyes, and $1\frac{1}{2}$ in the length of the snout. The pectoral fins extend to the vertical from the second soft ray of the anal fin; the second anal spine is rather longer and stronger than the third, and nearly one-third of the length of the head. Uniform silvery; a large black blotch behind the dorsal (in life).

Cape Seas.

a. Adult. D. $\frac{12}{14}$. A. $\frac{3}{14}$.

b. Adult. D. $\frac{12}{15}$. A. $\frac{3}{15}$.

c. Adult: stuffed. D. $\frac{12}{16}$. A. $\frac{3}{15}$. Cape Seas. Presented by Sir A. Smith.

d. Adult: stuffed. D. $\frac{12}{15}$. A. $\frac{3}{14}$. Cape Seas. Presented by Sir A. Smith.—Type of the species.

Description.—The body is rather elevated, its greatest depth being below the fourth dorsal spine, where it is nearly one-third of the total length. The profile of the nape forms a strong curve and is continued into that of the head, which is straight and descends abruptly to the snout; the distance between the occiput and the end of the snout is about three-quarters of that between the occiput and the origin of the dorsal fin. The head is compressed and rather short, its length being $4\frac{3}{1}$ in the total; the distance between the eyes is one-third of the length of the head. The snout is of moderate length, the upper maxillary reaching to the vertical from the posterior nostril. The præorbital is $1\frac{1}{2}$ as long as high, and does not entirely cover the maxillary bone. The eye is of moderate size, situated in the middle of the vertical from the neck to the inferior limb of the præoperculum. The nostrils are placed near the upper angle of the orbit; the posterior is a very small slit, the anterior more ovate in form. There are five series of scales between the præorbital and the limb of the præoperculum, which is also covered with a single series of scales. The posterior margin of the præoperculum is vertical, the angle and the inferior margin are curved. The operculum has an obtuse spine posteriorly, and is covered with scales, like the sub- and interoperculum. The suprascapula is scale-like, without any striæ or denticulations; and there is an indistinct curved series of scales, ascending from the suprascapula to the nape, which exhibit some inconspicuous striæ.

The *dorsal* fin begins immediately behind the vertical from the base of the pectoral, and extends to that from the fifty-sixth scale of the lateral line, its distance from the caudal fin being equal to one-half the length of the head. The spines are rather strong, compressed, and broader on one side; the first is one-half the length of the second; the fourth and fifth are the longest, nearly one-half the length of the head; the following gradually decrease in length to the last, which is 1½ in the length of the fourth. The soft rays are nearly equal in length to one another and to the last spine. The *caudal* fin is forked, one of the middle rays being nearly one-third of the upper lobe, which is rather longer than the lower. The origin of the *anal* fin falls vertically below that of the soft dorsal, and its end immediately behind that of the dorsal; it is scarcely lower than the opposite fin, but the posterior rays gradually become somewhat shorter. The spines are rather stout; the first is nearly one-half the length of the second; the second rather longer and stronger than the third, and about one-third of the length of the head. The *pectoral* fin has a few very small scales at the base; the sixth ray exceeds the others in length, reaching to the second anal ray. The base of the *ventrals* falls entirely behind that of the pectorals; they are of moderate length, the first ray extending to the vent; the spine is about three-quarters of the length of that ray. There is a long scaly flap inserted at the base of the ventral.

The *scales* are minutely ciliated at the outer margin, higher than wide; one of the largest covers one-third of the eye.

The *incisors* are moderately broad, very little narrower than in *S. rondeletii*; they are implanted in an oblique direction; there are six or eight in the upper jaw, and eight or ten in the lower. The molars are rather small, arranged in three series in the upper jaw, and in two in the lower; there is sometimes another molar at the inner side of the series of teeth in the lower jaw.

The examples are now uniform silvery, with a shining streak along each series of scales; the opercular margin, the dorsal, anal, and ventral fins are greyish. The black dorsal blotch on the lateral line, behind the dorsal, has disappeared.

	inches.	lines.
Total length	9	6
Height of the body	3	4
Length of the head	2	0
Distance between the eyes	0	8
——— between the dorsal and the occiput	1	11
——— between the occiput and the snout	1	4½
Diameter of the eye	0	6
Length of the fourth dorsal spine	0	11
——— of the twelfth dorsal spine*	0	7
——— of the upper caudal lobe	2	6
——— of the second anal spine	0	8½
——— of the pectoral	2	9
——— of the ventral	1	7
——— of a scale	0	2½
Height of a scale	0	3¾

4. Sargus vetula.

Scarus, *Rondel.* vi. cap. 2. p. 164; *Willughby*, i. p. 305. § 11.
Sargus vetula, *Cuv. & Val.* vi. p. 48; *Guichen. Explor. Sc. Algér. Poiss.* p. 47; *Webb & Berthelot, Hist. Nat. des Iles Canar. Poiss.* p. 29 (not pl. 9. f. 2).

D. $\frac{11}{14}$. A. $\frac{3}{13}$. L. lat. 75–80.

Four series of molar teeth in the upper jaw and three in the lower. The space between the eyes slightly convex. A brown spot on the suprascapula, another on the angle of the operculum; a black blotch across the back of the tail; ventrals black.

Mediterranean.

5. Sargus lineatus.

? *Cuv. & Val.* vi. p. 59.—[?? *Cuv. Règne Anim. Ill. Poiss.* pl. 34. f. 1.]

D. $\frac{12}{13}$. A. $\frac{3}{13}$.

Incisors moderately broad, implanted in an oblique direction, eight in each jaw. The distance between the origin of the dorsal and the occiput is much more than that between the occiput and the end of the snout. Body with four or five very narrow black cross-streaks; tail with a broad black band; base of the pectoral and he ventral fins black.

Coast of Brazil?

a. Fine specimen. From the Collection of the Zoological Society.

6. Sargus noct.

Sargus noct, (*Ehrenberg*) *Cuv. & Val.* vi. p. 51; *Rüpp. N. W Fische*, p. 110; *Guichen. Explor. Sc. Algér. Poiss.* p. 47.

D. $\frac{12}{14}$. A. $\frac{3}{13}$. Cæc. pylor. 5. Vert. 10/13.

Eight incisors in the upper jaw, six in the lower; four series of molars in the upper, three in the lower. Dorsal spines rather strong, the rays of the dorsal and anal fin short. On each side of the tail, on the lateral line, a round black spot.

Red Sea: Mediterranean.

Valenciennes describes the air-bladder as simple; but Rüppell informs us that it is bifurcate anteriorly and posteriorly.

a. Adult: stuffed: not good state. Red Sea. Presented by J. Burton, Esq.

7. Sargus argenteus.

Cuv. & Val. vi. p. 60.

D. $\frac{12}{14}$. A. $\frac{3}{14}$. L. lat. 65. L. transv. 9/16.

Incisors moderately broad, implanted in a rather oblique direction; three series of molars in the upper jaw, two in the lower. The diameter of the eye is $3\frac{1}{2}$ in the length of the head, $1\frac{1}{3}$ in that of the snout, and equal to the distance between the eyes. The crown of the head is slightly convex; a very slight protuberance above the upper anterior angle of the orbit. The pectoral fins extend scarcely to the origin of the anal, the ventrals to the vent; the second anal spine is longer and stronger than the third, and $2\frac{2}{3}$ in the length of the head. Silvery, with a black band across the back of the tail; ventrals blackish.

Coast of Brazil.

a. Rio Janeiro. Presented by A. Fry, Esq.

8. Sargus auriventris.

Peters, Wiegm. Archiv, 1855, p. 243.

D. $\frac{11}{14}$. A. $\frac{3}{11}$.

Bluish, shining; a narrow golden longitudinal streak above the ventrals. (*Pet.*)

This species does not appear to have a black caudal spot.

Mozambique.

9. Sargus annularis.

Sparulus, *Ovid.* v. 106 & 107.
Sparus, *Rondel.* v. c. 3; *Salvian.* f. 177; *Gesner.* pp. 180, 1056, 1058; *Willughby*, p. 308. pl. 5. f. 2.
Sparus, no. 12, *Artedi, Genera*, p. 37.
Sparus annularis, *L. Gm.* p. 1270; *Bl. Schn.* p. 272; *De la Roche, Ann. Mus.* xiii. p. 342. pl. 24. f. 13.
—— smaris, *Brünn. Pisc. Mass.* p. 40.
—— haffara, *Risso, Ichth. Nice*, p. 244.
Sciæna melanura, *Pall. Zoogr.* iii. p. 254.
Sargus annularis, *Geoffr. Descr. Eg. Poiss.* pl. 18. f. 3; *Cuv. & Val.* vi. p. 35. pl. 142; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 386, *Poiss.* pl. 4. f. 1; *Guichen. Explor. Sc. Algér. Poiss.* p. 47.

D. $\frac{11}{12\text{–}13}$. A. $\frac{3}{11}$. L. lat. 55. L. transv. 6/13. Cæc. pylor. 4. Vert. 9/14.

Incisors broad, implanted vertically. The diameter of the eye is four times in the length of the head, and $1\frac{1}{2}$ in that of the snout; the distance between the eyes is more than their diameter, and slightly convex. The pectoral fins extend slightly beyond the origin of the anal; the ventrals are much shorter and remote from the vent. The second and third anal spines are nearly equal, and rather longer than the diameter of the eye. Silvery: back with several more or less distinct cross-bars; axil not black; a broad black band across the back of the tail behind the dorsal fin; lateral line very conspicuous, greyish.

Mediterranean; Canary Islands.

a. Adult: bad state; has been in chloride of zinc. Mediterranean. Purchased of Mr. Frank.

b. Half-grown: bad state; has been in chloride of zinc. Mediterranean. Purchased of Mr. Frank.
c. Adult: bad state; has been in chloride of zinc. Malta. From the Haslar Collection.
d. Many young specimens. Malta. From the Haslar Collection.
e, f. Adult: bad state. From the Old Collection.
g, h. Adult. Lisbon.
i. Adult. Lanzarote. From the Rev. R. T. Lowe's Collection.
k. Adult.
l. Adult.
m. Half-grown.
n. Young. From the Haslar Collection.

10. **Sargus flavolineatus.**

Cuv. & Val. vi. p. 60.

D. $\frac{13}{11}$. A. $\frac{3}{10}$.

Incisors broad, implanted in a vertical direction. No transverse bands or caudal spot. Bluish, with 13–14 golden longitudinal bands (in life); vertical fins greyish. (*Val.*)

Shores of Cuba.

11. **Sargus unimaculatus.**

Margr. p. 153.
Perca unimaculata, *Bloch*, taf. 308. f. 1 (bad).
Grammistes unimaculatus, *Bl. Schn.* p. 184.
Sparus salin, *Lacép.* iv. pp. 136, 138.
Sargus humeri-maculatus, *Quoy & Gaim. Voy. Freyc. Zool.* p. 297.
—— unimaculatus, *Cuv. & Val.* vi. p. 62.
Cynædus brama, *Gronov. Syst. ed. Gray*, p. 56.

D. $\frac{13}{11}$. A. $\frac{3}{10}$. L. lat. 48. L. transv. 9/17. Cæc. pylor. 5 (7, *Val.*). Vert. 10/14*.

Incisors broad, each with a notch. The diameter of the eye is four times in the length of the head, and $1\frac{1}{2}$ in that of the snout; the distance between the eyes equals their diameter; there is a protuberance above the anterior angle of the orbit. The pectoral fins extend nearly to the origin of the soft portion of the anal fin; the ventrals do not reach to the vent. The second anal spine is curved, and much longer and stronger than the third, nearly one-half the length of the head. Reddish-silvery: a large black blotch behind the shoulder, below the lateral line.

Atlantic shores of Tropical America.

a. Adult. Brazil. Presented by Lord Stuart.
b. Adult: skeleton. Brazil. Presented by Lord Stuart.
c. Adult. Bahia. Purchased of M. Parzudaki.
d. Adult: skin: bad state. Rio Janeiro. Presented by Th. Thompson, Esq.

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* Valenciennes says fifteen, which certainly is incorrect.

e. Adult: not good state. Guatemala. Purchased of Mr. Frank.
f. Adult: bad state. Puerto Cabello. Purchased of Mr. Brandt.
g–i. Adult: skins. Jamaica. From Dr. Parnell's Collection.
k. Adult. From the Haslar Collection.
l. Half-grown: bad state. From the Haslar Collection.
m. Adult: stuffed.

Skeleton.—The *skeleton* differs very little from that of *S. vulgaris.* The occipital crest and the neural spines are not quite so elevated as in that species, and the upper maxillary bone is not pierced by a foramen. The length of the abdominal portion of the vertebral column is to that of the caudal as 1 : 1·3. The length of the first interhæmal equals that of the first vertebra to the seventh.

12. **Sargus ovis.**

Sparus, *Schœpff, Schriften der Gesellsch. Nat. Freunde,* viii. p. 152.
Sparus ovis, *Mitch. Trans. Lit. & Phil. Soc. New York,* i. p. 392. pl. 2. f. 5.
Sargus ovis, *Cuv. & Val.* vi. p. 53; *Storer, Report,* p. 36; *Dekay, New York Fauna, Fishes,* p. 89. pl. 8. f. 23; *Holbr. Ichth. S. Carol.* p. 51. pl. 8. f. 2.

D. $\frac{12}{11\ (Val.\ 13)}$. A. $\frac{3}{10}$. L. lat. 46. L. transv. 8/18.

Incisors broad, quadrilateral. A recumbent spine in front of the dorsal. The diameter of the eye is six times in the length of the head, and 2½ in that of the snout. The distance between the eyes is more than twice their diameter[*]. The pectoral fins extend nearly to the origin of the anal fin. The second anal spine is longer and stronger than the third, about one-third the length of the head. Body with five blackish cross-bars.

a. Twenty-two inches long: stuffed. N. America. Presented by Edward Doubleday, Esq.
b. Adult: skin. From Gronov's Collection.

13. **Sargus rhomboides.**

Sparus rhomboides, *Linn. Syst. Nat.* i. p. 427; *Shaw, Zool.* iv. p. 447: *Schœpff, Schrift. der Naturf. Freunde Berlin,* viii. p. 153.
Sargus rhomboides, *Cuv. & Val.* vi. p. 68. pl. 143, cop. by *Dekay, New York Fauna, Fishes,* p. 93. pl. 71. f. 228.
Lagodon rhomboides, *Holbr. Ichth. S. Carol.* p. 56. pl. 8. f. 1.

D. $\frac{12}{11}$. A. $\frac{3}{10}$. Cæc. pylor. 4.

A recumbent spine before the dorsal fin. Incisors moderately broad, each with a notch; two series of molars in each jaw. Body with longitudinal stripes, and sometimes with several dusky cross-bars. A black blotch at the origin of the lateral line.

Southern shores of the United States.

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[*] These measurements are taken from the very large specimen in the British Museum, and may be found different in younger individuals.

14. Sargus fasciatus.

Sargus fasciatus, *Cuv. & Val.* vi. p. 59; *Guichen. Explor. Sc. Algér. Poiss.* p. 48; ? *Valenc. in Webb & Berthelot, Hist. Nat. Iles Canar. Poiss.* p. 29 (not fig.).

D. $\frac{11}{12}$. A. $\frac{3}{10}$. L. lat. 60. L. transv. 9/16.

The height of the body is $3\frac{1}{3}$ in the total length, the length of the head four times. Molars small, in two series. Incisors $\frac{10}{8}$, narrow, elongate, implanted in an oblique direction; lips very thick and fleshy; snout rather elongate, twice the diameter of the eye. The pectoral fin scarcely reaches to the origin of the anal. Whitish (in spirits), with seven broad brown cross-bands, each three times as broad as the interspaces between.

? Brazil, *Cuv. & Val.*; Mediterranean, *Guich.*; Canary Islands, *Val.*

a. Fine specimen. From the Haslar Collection.

15. Sargus cervinus.

Charax cervinus, *Lowe, Trans. Zool. Soc.* ii. p. 177.
? Sargus cervinus, *Valenc. in Webb & Berthelot, Hist. Nat. Iles Canar. Poiss.* p. 29.
Sargus fasciatus, *Valenc. l. c.* pl. 9. f. 2 (not descript.).
—— hottentottus, *Smith, Ill. Zool. S. Afr. Fishes*, pl. 23. f. 1.

D. $\frac{11}{12-13}$. A. $\frac{3}{11}$. L. lat. 58–60*. L. transv. 9/16.

The height of the body is $2\frac{1}{2}$ in the total length, the length of the head four times. Molars small, in two series; incisors $\frac{12}{8}$, narrow, elongate, implanted in an oblique direction; lips very thick and fleshy; snout rather produced, twice the diameter of the eye. The pectoral reaches beyond the origin of the anal. Shining golden, with seven brown cross-bands, broader than the interspaces between them.

Madeira; Canary Islands; Cape Seas.

a. Very fine specimen Lanzarote. From the Rev. R. T. Lowe's Collection.

b. Stuffed. Cape Seas. Purchased of Sir A. Smith.—Type of *S. hottentottus*.

c. Young. Cape Seas. Presented by Sir A. Smith.

If we could always depend on the correctness of the descriptions given by Valenciennes, it would appear that there exist one or even two other species of these banded *Sargi* with thick lips, in the Seas of Madeira and the Canary Islands. The Rev. R. T. Lowe has kindly communicated to me his notes, taken on the spot, from seven specimens caught in Madeira; they all belong to the species with the high body, *Charax cervinus*, Lowe. The only discrepancy from my diagnosis, taken from a Lanzarote specimen, is, that Mr. Lowe states 65–66 scales of the lateral line; but, possibly, the small scales covering the caudal fin have been reckoned. Very different is the description of Valenciennes, which, if correct, clearly shows that he had a fish scarcely identical specifically with *Charax cervinus*, Lowe. On the other hand, the figure of *Sargus fasciatus*, given by him, agrees well with Mr. Lowe's fish, but not with that described in the 'Hist. Nat. des Poiss.' under that name, and said to have a *body much more elongate than in Sargus lineatus*. There is, apparently, confusion in the descriptions of M. Valenciennes, who, moreover, in the text refers the figure with the name of *S. fasciatus* to *S. vetula*. Therefore I think it of no great importance if he attribute to *S. fasciatus* $\frac{10}{10}$ incisors, whilst I find $\frac{10}{8}$. But, if the descriptions are really correct, we should have the following specific forms:—

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* Sometimes with several supernumerary scales on the caudal fin.

1. *Charax cervinus*, Lowe. Height of the body $2\frac{1}{2}$ in the total length. Incisors $\frac{12}{8}$. L. lat. 58–60 (66).—Madeira, Lanzarote.
2. *Sargus cervinus*, Val. in Webb & Berth. Height of the body one-third of the total length. Incisors $\frac{12}{8}$. L. lat. 50.—Canary Islands*.
3. *Sargus fasciatus*, Cuv. & Val. Body oblong. Incisors $\frac{10}{10}$.—Canary Islands, *Val. in Webb & Berth.*
4. *Sargus fasciatus*, Gthr. Height of the body one-third of the total length. Incisors $\frac{10}{8}$. L. lat. 60.—*Hab.* ——? Haslar Collection.

16. Sargus aries.

Cuv. & Val. vi. p. 58.

D. $\frac{12}{12}$. A. $\frac{3}{10}$.

Incisors very narrow and elongate. The second anal spine strong. Body with seven narrow vertical bands; ventral fins black. (*Val.*)

Atlantic coasts of South America.

17. Sargus ambassis. (PLATE XXVIII. fig. A.)

D. $\frac{12}{12}$. A. $\frac{3}{11}$. L. lat. 50. L. transv. $\frac{7-8}{16}$.

A recumbent spine before the dorsal fin. Incisors narrow, implanted in a rather oblique direction; two series of molars in both the jaws. Nape of the neck very convex; the upper profile of the head descending in a straight line. The diameter of the eye is $4\frac{2}{3}$ in the length of the head, half the length of the snout, and less than the distance between the eyes. The pectoral fins extend to the vertical from the second soft ray of the anal fin; the second anal spine is rather shorter and not stronger than the third, and $3\frac{2}{3}$

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* Mr. Lowe observes: "*Sargus cervinus*, Val., is, I think, merely a larger example of my *Charax cervinus*, the less depth being due to the irregular contraction in a dried specimen, such as almost, if not quite, all the fishes sent by Webb to Valenciennes were."

in the length of the head. Body uniform greenish, with golden longitudinal streaks; dorsal, anal, and ventral fins blackish; axil blackish.

Atlantic coasts of the United States.

a. Adult. New York. Purchased of Mr. Brandt as *S. ovis*.
b. Adult: skin. New York. From Dr. Parnell's Collection.
c. Thirteen inches long: not good state. N. America. Purchased of Mr. Warwick.
d. Adult: skin. From Gronov's Collection.
e. Adult: skeleton. Old Collection.

Description.—This species appears to have been confounded with the following North American fishes, which also exhibit a procumbent dorsal spine:—

1. With *Sargus ovis,* which has broad quadrilateral incisors.
2. With *Sargus rhomboides,* which has moderately broad incisors, each with a notch.
3. Perhaps with *Sargus aries* (a more southern species), which has the body marked with seven cross-bars.
4. With *Chrysophrys aculeatus,* which, according to Valenciennes' description, has three series of molars. In our species the anterior incisors, although sufficiently flattened, are so narrow, that a superficial observer might take them for conical canine-like teeth, as in *Chrysophrys.*

Our species, which I call *S. ambassis,* from the recumbent spine by which the genus *Ambassis* is distinguished, has the body elevated; its greatest depth is below the sixth dorsal spine, where it is contained 2½ in the total length. The nape of the neck descends abruptly in a somewhat irregular curve, whilst the upper profile of the head is straight. The distance between the origin of the dorsal fin and the occiput is shorter than the length from the occiput to the snout. The length of the head is nearly one-fourth of the total; the head is rather compressed, the distance between the eyes being one-fourth of the length of the head. The snout is elevated, rather pointed, and slightly produced; the præorbital is rhombic, as wide as high; the upper maxillary reaches to the vertical from the posterior nostril. The eye is of moderate size, situated in the vertical from the occiput. There are six series of scales between the præorbital and the limb of the præoperculum, which is covered at the angle with a few irregular scales besides; th operculum has a narrow space along its base scaleless, the remainaer is covered with scales like the sub- and interoperculum. The suprascapula is scale-like, striated, and there is a curved series of similar scales ascending from the suprascapula to the nape.

The *dorsal* fin begins above the opercular margin and extends to the vertical from the 37th scale of the lateral line, its distance from the caudal fin being equal to one-half the length of the head. The spines are of moderate size and taper very much at their extremity: the first is short; the fourth is the longest, one-half the length of the head; the following gradually decrease in length to the last, which is five-eighths of the longest. The upper margin of the dorsal is very slightly convex, but the posterior angle is rounded; the rays differ little in length, the posterior ones excepted, and are about three-fourths of the longest spine. The *caudal* fin is forked, one of the middle rays being not quite one-half of the rays of the upper lobe, which is longer than the lower. The distance of the caudal fin from the anal is much less than that from the dorsal. The origin of the *anal* falls vertically below the end of the spinous dorsal or the 22nd scale of the lateral line, its end below the 39th scale; it is much lower than the soft dorsal and has a slightly curved margin, nearly parallel to its base. The spines are moderately strong: the first nearly one-half the length of the second; the second not stronger and rather shorter than the third, and contained $3\frac{2}{3}$ in the length of the head; the first ray is rather longer than the last spine. The *pectoral* fin has a few very small scales at the base; the fifth ray exceeds the others in length, reaching to the second ray of the anal fin. The base of the *ventrals* falls entirely behind that of the pectorals; they are elongate, the first ray extending to the origin of the anal; the spine is about one-half of the length of that ray. There is a long scaly flap inserted at the base of the ventral.

The *scales* are minutely ciliated at the outer margin, higher than wide; one of the largest covers one-half of the eye.

The incisors have a conical root and the crown slightly compressed and flattened; there are six in the upper jaw and eight in the lower. The molars are arranged in two series, the inner of which contains the larger ones; all are of moderate size, but they gradually become larger posteriorly.

The scales are greenish, with an olive margin and golden centre; the dorsal, anal, and ventral fins and the axil are blackish.

	inches.	lines.
Total length	10	8
Height of the body	4	3
Length of the head	2	9
Distance between the eyes	0	$8\frac{1}{2}$
Length of the snout	1	2
Diameter of the eye	0	7
Distance between dorsal and caudal	1	4
——— between anal and caudal	1	1
Length of the fourth dorsal spine	1	4
——— of the twelfth dorsal spine	0	10
——— of the second dorsal ray	1	0
——— of the second anal spine	0	9
——— of the first anal ray	0	$10\frac{1}{2}$
——— of the pectoral	3	0
——— of the ventral	2	1
——— of a scale	0	4
Height of a scale	0	$5\frac{1}{2}$

Skeleton.—The jaw-bones, being armed with teeth much smaller than those of *Sargus vulgaris*, are therefore not so strongly developed as in that species. The intermaxillaries have their posterior processes elongate, with their base widened; the groove in which they move does not extend to the vertical from the anterior margin of the orbit. There are also no protuberances on the descending branches of the bone, which are uniformly wide to their extremity. The maxillary has the lower extremity very slightly bent forwards, and is without a foramen. The mandibulary is rather short and elevated, without a free space between the articular and dentary bones; there are five distinct pores from its muciferous channel. The head of the vomer is broad, flat, triangular. The lower limb of the præoperculum is one-third shorter than the posterior; both meet at a nearly right angle, which, however, is rounded. The interior ridge descends obliquely forwards, is flat, not prominent, with a rudimentary muciferous channel behind. The operculum is irregularly quadrangular, half as wide as high, with the upper side shortest and deeply notched; the ridge on its inner surface is very feeble. The sub- and interoperculum are of nearly equal length and width. The turbinal bone is tubiform anteriorly, widened and flat posteriorly. The præorbital is large, rhombic, the remainder of the infraorbital ring narrow; there is a bony plate at its inner side to support the eyeball from beneath. The frontal bones, between the orbits, are rather flat, with three low ridges and several pores and grooves. The occipital crest is high, strong, triangular, with the upper margin very slightly convex, and extends to above the centre of the orbit, terminating posteriorly with the occipital. The inner of the lateral ridges is very feeble, the outer one moderately developed. The basal portion of the brain-capsule is slightly compressed. The pubic bones are of moderate length; each of them is formed by three lamellæ of nearly equal development.

There are ten abdominal and fourteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the caudal as 1 : 1·44. There are three spurious interneurals, each with a small process above, directed forwards; the first two dorsal spines have one common interneural, with the horizontal spinous process, which is visible externally. The first interhæmal exhibits a peculiar transformation into a conical cavity, but in a slighter degree than in *Gerres gula*.

The *incisors* are very narrow, slightly curved, and six or eight in number; there is a band of small setiform and minute granular teeth behind them. The molars are small and arranged in two series in both the jaws.

15. CHARAX.

Charax, *Risso, Eur. Mérid.* iii. p. 353; *Cuv. & Val.* vi. pp. 9, 71.

Narrow incisors and *a single series of small molar teeth in both the jaws*. Cheeks scaly. The spines of the dorsal (eleven) folding into a groove; three anal spines. Opercles not armed. Scales of moderate size. Five branchiostegals. Pyloric appendages in small number. Air-bladder simple.

Mediterranean; Canary Islands.

1. Charax puntazzo.

Aldrov. De Pisc. p. 182; *Ray, Synops.* p. 130.
Sparus puntazzo, *L. Gm.* p. 1272.
—— annularis, *Brünn. Pisc. Mass.* p. 37.
—— acutirostris, *De la Roche, Ann. Mus.* xiii. p. 348. pl. 24. f. 12.
Charax acutirostris, *Risso, l. c.* p. 354.
—— puntazzo, *Cuv. & Val.* vi. p. 72. pl. 144; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 387. pl. 4. f. 2; *Guichen. Explor. Sc. Algér. Poiss.* p. 48.

D. $\frac{11}{13-14}$. A. $\frac{3}{12}$. L. lat. 55–60. Cæc. pylor. 7.

Silvery, with blackish vertical bands; a black blotch on each side of the tail. Snout produced.

Mediterranean; Canary Islands.

a. Adult. Dalmatia.
b. Very fine specimen, 19″ long. Lanzarote. Presented by the Rev. R. T. Lowe.

Fourth Group. PAGRINA.

Sparidæ with conical teeth in front and molars on the sides.

Synopsis of the Genera.

* Cheeks naked.

D. $\frac{10}{9}$. A. $\frac{3}{8}$	16. LETHRINUS.

** Cheeks scaly.

Canine teeth; molars in a single series	17. SPHÆRODON.
Canine teeth; the upper molar teeth in two series.	18. PAGRUS.
Canine teeth none	19. PAGELLUS.
Canine teeth; the upper molar teeth in three and more series	20. CHRYSOPHRYS.

16. LETHRINUS*.

Lethrinus, *Cuv. Règne Anim.*; *Cuv. & Val.* vi. p. 272.

Cheeks naked. Cardiform teeth in front of the jaws, with the addition of canines; lateral teeth in a single series—conical, or conical and molar-like, or obtuse molars. Formula of the fins: D. $\frac{10}{9}$. A. $\frac{3}{8}$. Scales of moderate size. L. lat. 45–50. Six branchiostegals. Two or three short pyloric appendages; air-bladder generally notched posteriorly, and with short lateral appendages.

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* 1. Lethrinus gothofredi, *Cuv. & Val.* vi. p. 286; *Rüpp. N. W. Fische*, p. 120.—Red Sea.
2. —— fasciatus, *Cuv. & Val.* vi. p. 290.—Trincomalee.
3. —— frenatus, *Cuv. & Val.* vi. p. 291.—Ceylon.
4. —— korely, *Cuv. & Val.* vi. p. 292.—Pondicherry.
5. —— maculatus, *Cuv. & Val.* vi. p. 292.—Pondicherry.
6. —— cinereus, *Cuv. & Val.* vi. p. 293.—Ceylon.
7. —— microdon, *Cuv. & Val.* vi. p. 295.—Buru.
8. —— olivaceus, *Cuv. & Val.* vi. p. 295.—Sunda Sea.
9. —— waigiensis, *Cuv. & Val.* vi. p. 297.—Waigiou; New Guinea.

From the Eastern shores of Africa through all the East Indian and Australian Seas to Polynesia; and one species on the Western coast of Africa.

I. Species with all the lateral teeth more or less conical, without true molars.

A. With a blackish blotch above the pectoral fin.

1. Lethrinus rostratus.

Lethrinus rostratus, (*Kuhl & van Hass.*) *Cuv. & Val.* vi. p. 296; *Bleek. Verh. Batav. Genootsch.* xxiii. *Spar.* p. 13.

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 50. L. transv. 6/16.

The height of the body is four times in the total length; the length of the head $3\frac{1}{5}$. The snout very elongate and pointed. The length of the diameter of the eyes is more than the width of the distance between them, and $2\frac{1}{2}$ in the length of the snout; the upper maxillary does not reach to the vertical from the anterior nostril. Canine teeth moderate; the teeth of the lateral series slightly compressed, pointed; the hindmost only of the upper jaw blunt and molar-like. Dorsal spines moderate; the third rather shorter than the longest ray, and $3\frac{1}{2}$ in the length of the head; the third anal spine intermediate between the second spine and the first ray. Caudalis emarginate. Olive (in

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10. Lethrinus sordidus, *Cuv. & Val.* vi. p. 298.—New Guinea.
11. —— flavescens, *Cuv. & Val.* vi. p. 299.—Tongatabu.
12. —— azureus, *Cuv. & Val.* vi. p. 300.—New Ireland.
13. —— cæruleus, *Cuv. & Val.* vi. p. 301.—Seychelles.
14. —— croceopterus, *Cuv. & Val.* vi. p. 302.—Seychelles.
15. —— argenteus, *Cuv. & Val.* vi. p. 303.—Seychelles.
16. —— borbonicus, *Cuv. & Val.* vi. p. 303.—Isle de France.
17. —— geniguttatus, *Cuv. & Val.* vi. p. 304.—East Indies.
18. —— genivittatus, *Cuv. & Val.* vi. p. 306. pl. 159.—Habitat —— ?
19. Sparus chærorhynchus, *Bl. Schn.* p. 278.—Lethrinus chærorhynchus, *Cuv. & Val.* vi. p. 308.—Japan?
20. Lethrinus virescens, *Cuv. & Val.* vi. p. 308.—Habitat —— ?
21. *Russell*, pl. 89.—Lethrinus karwa, *Cuv. & Val.* vi. p. 311.—East Indies.
22. Lethrinus abbreviatus, (*Ehrenb.*) *Cuv. & Val.* vi. p. 312.—Red Sea.
23. —— erythropterus, *Cuv. & Val.* vi. p. 313.—Ulea.
24. —— erythracanthus, *Cuv. & Val.* vi. p. 314.—Luganor.
25. —— alboguttatus, *Cuv. & Val.* vi. p. 314.—Bonin.
26. —— xanthopterus, *Cuv. & Val.* vi. p. 315.—Ulea.
27. Sparus miniatus, (*Forst.*) *Bl. Schn.* p. 281.—Lethrinus miniatus, *Cuv. & Val.* vi. p. 315.—Pacific.
28. Lethrinus anatarius, *Richardson, Ichthyol. Voy. Sulph.* p. 145.—Chinese Sea.
29. —— cyanoxanthus, *Richards. Ic.* pl. 4. f. 1.—Australia.
30. —— cinnabarinus, *Richards. Ic.* pl. 4. f. 2.—Australia.

spirits); head, body, dorsal and anal fins clouded with brownish; a quadrangular blackish blotch between the pectoral and the lateral line; the rays of the ventrals white, the membrane between blackish. Each joint of the rays of the vertical fins with a brownish streak.

Sunda and Molucca Seas.

a. Adult. Moluccas.
b. Half-grown. Amboyna. Purchased of Mr. Frank.
c. Half-grown. Ceram. From Madame Ida Pfeiffer's Collection.
d. Twenty-three inches long: skin: not good state. Ceylon. Collected by E. F. Kelaart, M.D.

2. **Lethrinus amboinensis.**

Bleeker, Amboina, v. p. 490.

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 48.

The height of the body is rather less than one-fourth of the total length; the length of the head is $3\frac{3}{5}$ in it. The snout is rather pointed, but not much longer than the diameter of the eye; the upper maxillary does not reach to the vertical from the orbit. Canine teeth of moderate size; the lateral teeth conical, and not obtusely rounded. The third and fourth dorsal spines longest, rather more than one-half of the height of the body. Caudalis emarginate, with pointed lobes. Head uniform olive; a large blackish blotch between the pectoral and the lateral line; back and sides largely marbled with blackish; base and spines of the dorsal fin and the pectoral rays variegated with violet.

Sea of Amboyna.

a. Half-grown. Amboyna. Purchased of Mr. Frank.

3. **Lethrinus moensii.**

Bleeker, Natuurk. Tydschr. Nederl. Ind. 1855, ix. p. 435.

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 48.

The height of the body is about four times in the total length, the length of the head $3\frac{2}{5}$ to 4. The snout is pointed, and much longer than the diameter of the eye, which is 3–$3\frac{1}{2}$ in the length of the head. Space between the eyes flat. The upper maxillary bone does not reach to the vertical from the anterior margin of the eye. Canine teeth large, curved; lateral teeth conical. The third dorsal spine longest, lower than one-half of the height of the body. Caudalis forked, with pointed lobes, the upper of which is longer. Greenish; snout and cheeks deep violet; body with seven indistinct cross-bands. In young and half-grown individuals a blackish blotch below the anterior half of the soft dorsal, and partly below the lateral line; opercular membrane red; each spine and ray of the dorsal fin with a brown spot at the base.

Seas of Groot-Oby, Batjan, and Timor; Louisiade Archipelago.

a. Adult: skin. Copang.
b, c. Adult: stuffed. Louisiade Archipelago. Presented by the Lords of the Admiralty.
d. Adult: stuffed. Louisiade Archipelago. Voyage of the Rattlesnake.

4. **Lethrinus nematacanthus.**

Bleeker, Japan, p. 403, and *Verhand. Batav. Genootsch.* xxvi. *Japan*, p. 91. tab. 6.

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 48.

The height of the body is nearly four times in the total length, the length of the head 4 to $3\frac{3}{4}$; the snout is slightly elongate and pointed; the diameter of the eye is $1\frac{1}{2}$ in the length of the snout. The upper maxillary bone reaches to or nearly to the vertical from the anterior margin of the eye. Canine teeth moderate; the lateral teeth conical, the posterior ones more obtuse and rather rounded*. Dorsal spines slender; the second is the longest, flexible, longer than the longest ray, and than one-half of the length of the head. Caudalis slightly emarginate. Olive, shining golden, with four or five orange-coloured longitudinal bands; head and body with indistinct and irregular brownish spots; a blackish blotch between the pectoral and the lateral line; spines and rays of all the fins (except of the pectorals) with brownish spots.

Sea of Japan; Louisiade Archipelago.

a. 8″ long; filament 1″ long: stuffed. Louisiade Archipelago. Presented by the Lords of the Admiralty.
b. 6″ long; filament indistinct: stuffed. Louisiade Archipelago (30 fathoms). Voyage of the Rattlesnake.

5. **Lethrinus richardsonii.**

Lethrinus hæmatopterus, *Richardson, Zool. Sulph. Fishes*, p. 144. pl. 64. f. 1–3; *Bleek. Verhand. Batav. Genootsch.* xxvi. *Japan*, p. 91 (not *Schleg.*).

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 48. L. transv. 5/17.

The height of the body is 3–$3\frac{1}{4}$ in the total length, the length of the head $3\frac{1}{2}$. The snout is slightly elongate and pointed; the diameter of the eye is rather more than the width between the orbits, and $1\frac{1}{2}$–$1\frac{2}{3}$ in the length of the snout. The upper maxillary reaches to the vertical from the anterior nostril. Canine teeth rather small; all the teeth of the lateral series conical, none molar-like. Dorsal and anal spines rather stout†; the fourth and fifth longest, but distinctly shorter than the rays, and about $2\frac{1}{2}$ in the length of the head. Caudalis emarginate. Brownish olive (in spirits), indistinctly marbled with darker; a black roundish blotch between the lateral line and the pectoral fin.

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* This does not agree with the figure, which exhibits all the lateral teeth conical, pointed, and small.

† The figure quoted represents them too slender.

China Sea.

- *a.* Adult: stuffed. China. Presented by J. R. Reeves, Esq. Original specimen of the figure quoted.
- *b, c.* Adult: skins. China. Purchased of Mr. Warwick.
- *d.* Half-grown. China.
- *e.* Half-grown. China.
- *f.* Half-grown: bad state. Hong Kong. From the Haslar Collection.
- *g.* Half-grown. Hong Kong. Presented by Sir J. Richardson.
- *h.* Half-grown. Hong Kong. Presented by Sir J. Richardson.
- *i.* Half-grown.
- *k.* ? Young. From the Collection of the Zoological Society.

B. Without blackish lateral blotch.

6. Lethrinus reticulatus.

Cuv. & Val. vi. p. 298; *Bleeker, Banda,* iii. p. 96.

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 43 (48?).

The height of the body is $3\frac{1}{2}$–4 in the total length, the length of the head $3\frac{3}{4}$; the snout is pointed, scarcely longer than the diameter of the eye, which is one-third of the length of the head; the upper maxillary bone reaches nearly to the vertical from the anterior margin of the eye. Canine teeth distinct and curved; lateral teeth conical, the posterior ones obtuse. Caudalis emarginate, with pointed lobes. Olive or rose-coloured: head and body with violet specks, arranged in irregular transverse bands; generally two violet streaks from the eye to the snout; the spinous dorsal marbled with violet; ventral fins violet; the rays of the vertical fins with fine cross-streaks. (*Bl.*)

Seas of New Guinea and Banda.

7. Lethrinus chrysostomus.

Richards. Voy. Ereb. & Terr. Ichthyol. p. 118. pl. 60. f. 6, 7.

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 48. L. transv. 5/16.

The height of the body is three times in the total length, the length of the head $3\frac{1}{4}$. The snout is elongate and pointed, and the eye, in adult specimens, of rather small size, its diameter being less than the distance between the eyes, or nearly one-third of the length of the snout*. The upper maxillary reaches to the vertical from the posterior nostril. Canine teeth rather strong; the teeth in the lateral series are of moderate size, conical and pointed, the hindmost rather shorter and blunt. Dorsal spines moderate; the third is rather shorter than the longest ray, and $3\frac{4}{5}$ in the length of the head. Olive, each scale of the back and of the sides with a black vertical streak at its base; head, dorsal, caudal, anal, and ventral fins blackish brown; the caudal variegated with lighter.

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* In immature specimens of 6″ length, the eye appears larger and the snout less elongate, the diameter of the former being $1\frac{1}{2}$ in the length of the latter. The lateral teeth have more the appearance of molars, and become more pointed with age only.

Norfolk Islands; Australian Seas.

a. Adult. Norfolk Islands. Presented by Sir J. Richardson.—Type of the species.
b. 18″ long: stuffed. Voyage of H.M.S. Herald.
c. Adult: stuffed. Cape York. Voyage of the Rattlesnake.
d. Young: stuffed. Cape York. Voyage of the Rattlesnake.
e. Half-grown: stuffed. Victoria. Voyage of H.M.S. Herald.

8. **Lethrinus latifrons.**

Lethrinus variegatus, *Cuv. & Val.* vi. p. 287.
—— elongatus, *Cuv. & Val.* vi. p. 289.
? Lethrinus semicinctus, *Cuv. & Val.* vi. p. 294.
Lethrinus latifrons, *Rüpp. N. W. Fische*, p. 118. taf. 28. f. 4; *Bleek. Celeb.* i. p. 220.

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 50. Cæc. pylor. 2.

The height of the body is five times in the total length, the length of the head $3\frac{2}{5}$; the diameter of the eye is $3\frac{1}{2}$ in the length of the head, and $1\frac{1}{2}$ in that of the snout; the snout is pointed, and the upper maxillary bone does not reach to the vertical from the anterior margin of the orbit. The interspace between the eyes equals one-third of the greatest depth of the body. Canine teeth large; all the lateral teeth conical. The fourth dorsal spine is the longest, higher than the soft dorsal, and $2\frac{1}{2}$ in the length of the head. Greenish, with five or six darker cross-bands; the rays of the dorsal and caudal fins variegated with darker, the other fins immaculate.

Red Sea; East Indian Seas.

II. Species with distinct molar teeth.

A. With a blackish lateral blotch.

9. **Lethrinus harak.**

Sciæna harak, *Forsk.* p. 52.
Lethrinus harak, *Rüpp. N. W. Fische*, p. 116. taf. 29. f. 3; ? *Bleek. Verhand. Batav. Genootsch.* xxiii. *Spar.* p. 15.
? Lethrinus erythrurus, *Cuv. & Val.* vi. p. 293.
? Lethrinus rhodopterus, *Bleek. Singapore*, i. p. 65.

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 47. L. transv. 6/14.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head four times; the snout moderately elongate and pointed. The diameter of the eye is longer than the distance between the eyes, and

$1\frac{3}{4}$ in the length of the snout. There is a slight protuberance before the upper anterior angle of the eye; the upper maxillary reaches to the vertical from the anterior nostril. Canine and molar teeth moderate. Dorsal spines rather feeble; the fourth is the longest, rather shorter than the highest ray, and $2\frac{3}{4}$ in the length of the head. Caudalis slightly emarginate. Greenish olive, with an oblong lateral blotch of blackish colour below the lateral line and below the middle of the dorsal fin.

Red Sea; East Indian Seas.

a. Adult: stuffed. Red Sea. From Dr. Rüppell's Collection.

B. Without blackish lateral blotch.

10. Lethrinus ramak.

Sciæna ramak, *Forsk.* p. 52.
Lethrinus ehrenbergii, *Cuv. & Val.* vi. p. 312.
—— ramak, *Rüpp. N. W. Fische,* p. 117. taf. 28. fig. 3.

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 48. L. transv. 6/15.

The height of the body equals the length of the head, and is $3\frac{3}{4}$ in the total. The snout is rather elongate and pointed; the length of the diameter of the eyes is rather more than the width of the distance between them, and one-half the length of the snout; the upper maxillary bone does not reach to the vertical from the anterior nostril. Canine and molar teeth rather small. Dorsal spines moderate, the fourth nearly equal to the longest ray, and one-third of the length of the head. Caudalis emarginate. Uniform olive; in life with an indistinct shining yellowish longitudinal streak.

Red Sea. [? Sea of Ceylon.]

a. Adult: stuffed. Red Sea.
b. ? Adult: skin. Ceylon. Presented by E. F. Kelaart, M.D.

11. Lethrinus cocosensis.

Bleeker, Kokos, p. 40.

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 50.

The height of the body is four times in the total length, the length of the head $3\frac{5}{6}$. The diameter of the eyes is $3\frac{1}{2}$ in the latter, and more than the distance between them. The snout is longer than the eye, and the upper maxillary bone does not reach to the vertical from the anterior margin of the orbit. The posterior teeth are molars; canines moderate. The fifth dorsal spine longest, one-third shorter than the height of the body, and shorter than the rays. Caudalis forked, with pointed lobes. Olive, with four or five orange-coloured or red longitudinal bands; fins immaculate, reddish yellow, the spinous dorsal brown-edged. (*Bl.*)

Sea of Nova Selma (Kokos Islands)

12. Lethrinus atlanticus.

? Lethrinus atlanticus, *Cuv. & Val.* vi. p. 275.

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 45. L. transv. 5/13.

The height of the body equals the length of the head, and is $3\frac{2}{3}$ in the total; the longitudinal diameter of the eyes is much more than the width between them, and $1\frac{1}{3}$ in the length of the snout; the upper maxillary bone reaches to the vertical from the posterior nostril. Canine teeth moderate, the molars rather small. Dorsal spines moderate; the fourth is the longest, rather longer than the longest ray, and $2\frac{1}{2}$ in the length of the head. Uniform greenish olive, the spinous dorsal blackish.

West coast of Africa.

a. 6″ long. River Niger. From Mr. Fraser's Collection.

Although my description differs from that of Valenciennes in several points, I have little doubt that the fishes themselves are identical, whilst the descriptions are taken from specimens of different age.

13. Lethrinus kallopterus.

Bleeker, Act. Soc. Nederl. i. *Manado en Makassar*, p. 47.

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 50.

The height of the body equals the length of the head, and is $3\frac{1}{2}$ in the total. The snout is pointed and much longer than the diameter of the eye, which is $3\frac{4}{5}$ in the length of the head; the upper maxillary reaches to the vertical from the anterior margin of the eye. Canine teeth large; molar teeth. The third and fourth dorsal spines longest, one-third only of the height of the body, whilst the soft dorsal is one-half of it; caudalis slightly emarginate. Above olive, snout and cheeks red-spotted; the rays of the fins beautifully red; the spinous dorsal and the anterior portion of the soft spotted with violet and yellow; the anal fin and the base of the caudal spotted with yellow. (*Bl.*)

Sea of Manado.

14. Lethrinus nebulosus.

Sciæna nebulosa, *Forsk.* p. 52.
Lethrinus nebulosus, *Cuv. & Val.* vi. p. 284; *Rüpp. N. W. Fische*, p. 118.
—— centurio, *Cuv. & Val.* vi. p. 301; *Peters, Wiegm. Arch.* 1855, p. 243.
—— esculentus, *Cuv. & Val.* pl. 158.

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 48. L. transv. 6/15.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head four times. The snout is rather elongate and pointed. The length of the diameter of the eyes is rather more than the width of the distance between them, and $1\frac{3}{4}$ in the length of the snout; the upper maxillary reaches to the vertical from the anterior nostril. There is a slight protuberance before the upper anterior angle of the orbit. Canine and molar teeth moderate. Dorsal spines moderate; the fourth rather shorter than the longest ray, and one-third of the length of the head; caudalis forked, with pointed lobes. Olive; bluish spots on the sides of the head.

Red Sea; Seychelles; Coast of Mozambique.

a. Adult: stuffed. Red Sea. From Dr. Rüppell's Collection.

15. Lethrinus opercularis.

Cuv. & Val. vi. p. 289; *Bleeker, Verhand. Batav. Genootsch.* xxiii. *Spar.* p. 14.

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 44.

The height of the body is $3\frac{1}{3}$ in the total length, the length of the head $3\frac{1}{2}$–$3\frac{2}{3}$; the diameter of the eye is $1\frac{1}{2}$ in the length of the snout; the præorbital higher than the orbit. The molars of moderate size. The fourth, fifth and sixth dorsal spines are the longest. Greenish olive, the scales on the back with a pearl-coloured spot; the opercular margin red; dorsal and anal fins rose-coloured, transparent, with violet margin. (*Bl.*)

Seas of Batavia, Bantam, and Samarang.

16. Lethrinus xanthotænia.

? Lethrinus ornatus, *Cuv. & Val.* vi. p. 310.

Lethrinus xanthotænia, *Bleeker, Natuurk. Tydschr. Nederl. Ind.* 1851, ii. p. 176.

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 50.

The height of the body is $3\frac{1}{4}$ in the total length, the length of the head $3\frac{1}{2}$–$3\frac{3}{4}$; the diameter of the eye is $2\frac{1}{3}$–3 times in the latter, and equal to the length of the snout. Canine teeth small, the posterior teeth short, tubercular. The fourth, fifth and sixth dorsal spines longest; caudalis slightly emarginate. Greenish olive, with five or six yellow longitudinal bands; the opercular membrane, the dorsal and caudal fins red, the other fins yellow. (*Bl.*)

Seas of Java and Sumatra.

17. Lethrinus leutjanus.

? Bodianus leutjanus, *Lacép.* iv. p. 281.

? Lethrinus leutjanus, *Cuv. & Val.* vi. p. 309.

Lethrinus leutjanus, *Bleek. Verhand. Bat. Genootsch.* xxiii. *Spar.* p. 14.

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 48. L. transv. 6/14. Cæc. pylor. 3.

The height of the body is $3\frac{1}{4}$ in the total length, the length of the head $3\frac{1}{2}$. The snout is rather elongate and pointed. The diameter of the eye equals the width between the orbits, and is one-half the length of the snout. The upper maxillary reaches to the vertical from the anterior nostril. Canine teeth moderate; the posterior teeth of the upper jaw are rather obtuse and molar-like. Dorsal spines moderate; the fourth is the longest, and $2\frac{1}{2}$ in the length of the head; caudalis emarginate. Reddish olive (in spirits); the scales on the back with a very distinct pearl-coloured spot in the centre.

West coast of Sumatra.

a. Fine specimen. From the Haslar Collection.
b. Half-grown. From the Haslar Collection.

18. **Lethrinus glyphodon.** (Plate XXV.)

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 48. L. transv. 6/15.

The height of the body is $2\frac{4}{5}$ or 3 times in the total length, the length of the head $3\frac{1}{3}$. The snout is elongate and pointed. The diameter of the eye equals the width between the orbits, and is one-half the length of the snout. The upper maxillary reaches to the vertical from the posterior nostril. Canine teeth moderate, the molars large, and with a longitudinal groove on the crown. Dorsal spines rather slender; the third, fourth and fifth are the longest, and about one-third of the length of the head. Caudalis emarginate. Uniform olive (in a dried state).

Louisiade Archipelago.

a. Adult. Louisiade Archipelago. From Mr. Macgillivray's Collection.
b. Adult. Louisiade Archipelago (fifteen fathoms). Voyage of the Rattlesnake.

Description.—The general form of this species is rather stout and elevated, the greatest height of the body, above the base of the ventrals, being one-third of the total length, or even more. The upper profile of the neck is convex, and is continued into that of the head, which is straight. The length of the head is $3\frac{1}{3}$ in the total; the snout elongate and pointed, twice the diameter of the eye. The upper maxillary reaches to the vertical from the posterior nostril when the mouth is closed, and is entirely hidden beneath the large præorbital, which is rather higher than long. The diameter of the eye is one-fifth of the length of the head, and equals the space between the orbits, which is flat or very slightly convex. The operculum and suboperculum are covered with scales, and the former terminates in a very obtuse point with a slight notch above it.

The spines of the *dorsal* fin are rather slender, slightly compressed on one side. The third, or the third, fourth and fifth spines are the longest, about one-third the length of the head, but rather shorter than the fifth and sixth rays, which form the highest part of the soft dorsal. The *caudal* is slightly emarginate, with the lobes somewhat pointed. The *anal* spines are rather stronger, but shorter, than those of the dorsal fin: the first is three-fifths of the second, the second intermediate in length between the first and third; the third is $3\frac{1}{3}$ in the length of the head, and rather shorter than the first ray, which equals the longest dorsal spine. Of the *pectoral* rays the third is the longest, reaching to the vertical from the origin of the anal fin; it is one-third of the total length. The *ventral* fins are inserted behind the pectorals, and reach nearly to the origin of the anal; their length is 4$\frac{4}{5}$ in the total; the spine is rounded, and about two-thirds of the adjacent ray. There are four canine *teeth* in the upper jaw, and two in the lower. The molars are broad, and the largest ones have a longitudinal groove, the crown exhibiting two tubercles; the groove and the tubercles are less distinct in the larger of the specimens; the three anterior lateral teeth are more conical; there are six or eight teeth in the upper jaw, and eight in the lower. A villiform band behind the canines.

The ground-colour is now yellowish olive (rose-coloured in life ?), with a golden longitudinal streak along each series of scales. The fins are colourless.

	inches.	lines.
Total length	13	8
Height of the body	4	11
Length of the head	4	2
Diameter of the eye	0	10
Length of the third (or fourth) dorsal spine.	1	5$\frac{1}{2}$
—— of the sixth dorsal ray	1	6$\frac{1}{2}$
—— of the third anal spine	1	3
—— of the first anal ray	1	5$\frac{1}{2}$
—— of the pectoral fin	3	7
—— of the ventral fin	2	10

19. Lethrinus mahsena.

Sciæna mahsena, *Forsk.* p. 52.
Lethrinus bungus, (*Ehrenbg.*) *Cuv. & Val.* vi. p. 279.
—— mahsena, *Cuv. & Val.* vi. p. 313; *Rüpp. N. W. Fische*, p. 119. taf. 29. f. 4 (dorsal spines rather too slender).

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 47. L. transv. 5/15. Cæc. pylor. 3.

The height of the body is three times in the total length, the length of the head 3$\frac{1}{3}$. The upper profile of the head somewhat gibbous above the eyes (at least, in adult specimens). The eye is not very large, its diameter being 2$\frac{1}{2}$ in the length of the snout, which is very moderately produced. The upper maxillary reaches to the vertical from the anterior margin of the eye. Lips fleshy. Canines very large; the posterior molar teeth with a distinct longitudinal impression. Dorsal spines rather compressed and broad on one side; the third is nearly equal to the longest ray, and 3$\frac{1}{2}$ in the length of the head; the pectoral fins reach beyond the origin of the anal; caudal forked, with rounded lobes. Greenish; in adult preserved specimens several indistinct lighter cross-bands.

Red Sea.

a. Sixteen inches long: stuffed. Red Sea. Presented by J. Burton, jun., Esq.

20. Lethrinus mahsenoides.

? Lethrinus mahsenoides, *Cuv. & Val.* vi. p. 286.
Lethrinus mahsenoides, *Bleek. Ver. Bat. Genootsch.* xxiii. *Spar.* p. 15.

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 48. L. transv. 6/15.

The height of the body is three times in the total length, the length of the head 3¾; the diameter of the eye is 3½ in the latter, and 1½ in the length of the snout and in the height of the præorbital. Canine teeth strong, molars moderate. The fourth, fifth and sixth dorsal spines longest. Uniform greenish olive, the opercular membrane red.

Seas of Batavia (and Amboyna); Philippine Islands.

a. Fine specimen. Philippines.
? *b*. Half-grown. Amboyna. Purchased of Mr. Frank.

21. Lethrinus hæmatopterus.

Lethrinus hæmatopterus, *Temm. & Schleg. Faun. Japon. Poiss.* p. 74. pl. 38 (not *Richards.* or *Bleek.*).

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 48. L. transv. $\frac{6}{15\text{–}16}$.

The height of the body is three times in the total length, the length of the head 3½. The snout is rather elongate and pointed. The diameter of the eye is rather less than the distance between the eyes, and 2⅓ in the length of the snout. The upper maxillary reaches scarcely to the vertical from the anterior nostril. Canine teeth moderate; the teeth of the lateral series blunt, rounded molars, with a very indistinct impression on the crown. Dorsal spines moderate, very much tapering; the third shorter than the longest ray, and nearly one-third the length of the head; caudalis emarginate. Greenish olive, each scale of the back and of the sides with a blackish spot at the base. The soft portions of the dorsal and anal fins red.

Sea of Japan.

a. Twenty inches long: stuffed. Japan. Purchased of Mr. Frank.

22. Lethrinus latidens.

Cuv. & Val. vi. p. 316.

D. $\frac{10}{10}$. A. $\frac{3}{9}$.

Snout short. A series of molar teeth in the upper jaw, the second of which is twice as broad as long; the three posterior ones are still larger. Six molar teeth in the lower jaw, two of which are large. A blackish appendage behind each dorsal spine. Coloration uniform; axil of the pectorals and three spots on the anal fin black. (*Val.*)

New Guinea.

17. SPHÆRODON.

Chrysophrys, sp., *Cuv. & Val.* vi. p. 134.
Sphærodon, *Rüpp. N. W. Fische*, p. 112.
Pagrus, sp., *Bleek. Gilolo*, p. 54.

Jaws with several conical canine-like teeth in front, and with a single series of molars on the sides. Cheeks scaly. Dorsal fin with ten spines, which can be received in a groove; three anal spines. Scales of moderate size. Six branchiostegals. Pyloric appendages in small number.

Red Sea; East Indian Archipelago.

1. Sphærodon grandoculis.

Sciæna grandoculis, *Forsk.* p. 53; *L. Gm.* p. 1305.
Sparus grandoculis, *Bl. Schn.* p. 276; *Lacép.* iv. p. 111.
Chrysophrys grandoculis, *Cuv. & Val.* vi. p. 134.
Sphærodon grandoculis, *Rüpp. N. W. Fische*, p. 113. taf. 28. f. 2.

D. $\frac{10}{10}$. A. $\frac{3}{9}$. L. lat. 46. L. transv. 5/16. Cæc. pylor. 3.
Vert. 10/14.

Eyes large. The dorsal spines equal on both sides; the third anal spine longest; the spinous dorsal with two series of bluish spots, some of the rays of the dorsal and anal fins with a black spot behind their base.

Red Sea.

a, b. Adult: stuffed. Red Sea. Presented by Dr. Rüppell.

2. Sphærodon heterodon.

Pagrus heterodon, *Bleeker*, *Gilolo*, p. 54.

D. $\frac{10}{10}$. A. $\frac{3}{9}$. L. lat. 48. L. transv. 5/14.

The height of the body is $3\frac{3}{4}$ in the total length, the length of the head $3\frac{2}{5}$; the diameter of the eye is $2\frac{2}{5}$ in the latter; the præorbital is half the width of the orbit. Dorsal spines not elongate. Rose-coloured; the scales with violet margins; base of the pectorals violet.

Seas of Halmaheira and Amboyna.

a. Young. Amboyna. Purchased of Mr. Frank.
?*b.* Adult: skin: bad state. Ceylon. Collected by F. Kelaart, M.D.
A. $\frac{3}{10}$.

18. PAGRUS*.

Pagrus, *Cuv. Règne Anim.*; *Cuv. & Val.* vi. p. 141.

Several pairs of strong, conical, canine-like teeth in the outer series of both the jaws; the molars are arranged in two series. Cheeks scaly. The spines of the dorsal (twelve, rarely eleven) are sometimes elongate, and can be received in a groove; three anal spines. Scales of moderate size. Six branchiostegals. Pyloric appendages in small number (in one species none); air-bladder simple.

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* 1. Sparus hurta, *L. Mus. Ad. Fried.* ii. p. 73; *Syst. Nat.* i. p. 469; *L. Gm.* p. 1272; *Bl. Schn.* p. 273; *Risso, Ichth. Nice*, p. 255.—Aurata hurta, *Risso, Eur. Mérid.* p. 358.—Pagrus hurta, *Cuv. & Val.* vi. p. 152.—?Cynædus torvus, *Gronov. Syst. ed. Gray*, p. 54.—Mediterranean.

2. Sciæna lata, *Solander*.—Pagrus latus, *Richardson, Ann. & Mag. Nat. Hist.* 1842, ix. p. 392.—New Zealand (identical with *P. guttulatus* or *unicolor*?).

3. Dentex macrocephalus, *Cuv. Règne Anim. Ill. Poiss.* pl. 35. f. 2 (see p. 366)

Mediterranean; Coasts of Africa; Atlantic shores of the United States; East Indian and Australian Seas.

A. Species with the dorsal spines not elongated.

1. Pagrus vulgaris.

Πάγρος, *Aristot.* viii. cap. 13 & 17.
Pagrus, *Rondel.* v. c. 15. p. 142.
Sparus, no. 4, *Artedi, Genera,* p. 36.
Duhamel, iv. cap. 2. p. 29.
Sparus pagrus, *Linn. Syst. Nat.* i. p. 469; *Brünnich, Pisc. Mass.* p. 94; *Risso, Ichth. Nice,* p. 241; *De la Roche, Ann. Mus.* xiii. p. 317; *Martens, Reise nach Venedig,* ii. p. 425.
—— argenteus, *Bl. Schn.* p. 271.
Pagrus vulgaris, *Cuv. & Val.* vi. p. 142. pl. 148; *Yarrell, Brit. Fishes,* i. p. 116, figure copied from *Cuv. & Val. l. c.* (not description or vignette); *Webb & Berthel. Hist. Nat. Iles Canar. Poiss.* p. 32; *Guichen. Explor. Scient. Algér. Poiss.* p. 49.

D. $\frac{12}{10}$. A. $\frac{3}{8}$. L. lat. 56. L. transv. 6/13. Vert. 9/15.

The height of the body is $3\frac{1}{3}$ in the total length, the length of the head $3\frac{2}{3}$; the diameter of the eye is $1\frac{1}{3}$ in the distance between the eyes, and $1\frac{2}{3}$ in the length of the snout. The upper profile of the neck and head is parabolic; an obtuse protuberance before the upper anterior angle of the eye; the præorbital is $1\frac{1}{3}$–$1\frac{1}{4}$ as long as high, and has an incision in front. Dorsal spines not elongate; the second anal spine stronger, but not longer, than the third, one-fourth of the length of the head; pectoral elongate, reaching to the fourth soft ray of the anal fin. Silvery; back rose-coloured.

Mediterranean; Sea of Madeira and of the Canary Islands.

a. Adult.
b. Very fine specimen. Lanzarote. From the Rev. R. T. Lowe's Collection.
c. Half-grown. Orotava. Presented by the Rev. R. T. Lowe.
d. Adult: skin. From the Collection of the Zoological Society.

Yarrell has entirely mistaken this fish, and, as we shall see hereafter, some other species of the Sparidæ. The specimen from which he made the description and a drawing of the dentition (pp. 117–119) is in the Collection of the British Museum, and belongs to *Pagellus erythrinus.* The figure of the fish and the notes on the synonymy (pp. 116–117) are taken from the 'Histoire Naturelle des Poissons, par Cuv. & Val.' It appears to me highly probable that *Pagrus vulgaris* does not reach so far northwards as the coast of Great Britain, as I have neither met with this species on the coast or in fish-markets, nor found a British specimen among the numerous skins of British

Sparidæ in the Collection of the British Museum. The specimens mentioned in Mr. White's Catalogue of British Fishes as belonging to *Pagrus vulgaris* are likewise *Pagellus erythrinus*.

2. Pagrus orphus.

Aurata orphus, *Risso, Eur. Mérid.* iii. p. 356.
Pagrus orphus, *Cuv. & Val.* vi. p. 150. pl. 149; *White, Catal. Brit. Fishes*, p. 17; *Webb & Berthel. Hist. Nat. Iles Canar. Poiss.* p. 32.

D. $\frac{12}{10}$. A. $\frac{3}{8}$. Cæc. pylor. 5.

The height of the body is one-third of the total length, the length of the head one-fourth; the diameter of the eye is one-third of the length of the head, and less than the distance between the eyes. The upper profile of the head is parabolic between the origin of the dorsal fin and the eye; thence it descends abruptly to the snout, and is rather concave. The lower jaw projects slightly beyond the upper. Præorbital elevated. Dorsal spines not elongate; the second anal spine stronger, but not longer, than the third; pectoral elongate, reaching to the fourth soft ray of the anal fin. Rose-coloured, with a blue cross-band between the eyes.

Coast of Nizza (and of Cornwall?); Canary Islands.

a. 21″ long: stuffed. Polperro, Cornwall. Presented by J. Couch, Esq.

It is not without doubt that I follow the opinion of Mr. White and refer this specimen to the above species. It is evidently somewhat deformed by stuffing, and does not appear to have the dentition of a true *Pagrus*.

3. Pagrus laniarius.

Cuv. & Val. vi. p. 163.

D. $\frac{12}{10}$. A. $\frac{3}{8}$. L. lat. 54–58. L. transv. 8/16.

The height of the body is $3\frac{2}{5}$ in the total length, the length of the head $3\frac{4}{5}$. The distance between the eyes is rather flat, and nearly equals the diameter of the eye, which is $1\frac{2}{3}$ in the length of the snout. The upper profile from the nape to the snout is nearly straight, obliquely descending. The maxillary bone with a prominence situated near its base, and received in a notch of the præorbital. The præorbital is nearly as high as long; there are ten series of scales between the præorbital and the interior ridge of the præoperculum, the limb of which is covered with scales. The outer pair of canines in the upper jaw bent outwards. Dorsal spines rather strong, compressed on one side; the second and third anal spines strong, and nearly equal to one-third of the length of the head; pectoral not reaching to the anal fin. Uniform reddish.

Cape Seas.

a, b. Adult: stuffed. Cape Seas. From Sir A. Smith's Collection
c. Adult: skin. False Bay.

4. Pagrus unicolor.

Chrysophrys unicolor, *Quoy & Gaim. Voy. Uran.* p. 299.
Pagrus unicolor, *Cuv. & Val.* vi. p. 162; *Richardson, Ichth. China,* p. 242.
—— guttulatus, *Cuv. & Val.* vi. p. 160: *Less. Voy. Coq. Zool.* ii. p. 188.

D. $\frac{12}{10}$. A. $\frac{3}{8}$. L. lat. 52. L. transv. 8/17. Cæc. pylor. 5.

The height of the body is $2\frac{2}{3}$ in the total length, the length of the head $3\frac{1}{2}$; the diameter of the eye equals the distance between the eyes, and is $1\frac{1}{3}$ in the length of the snout*; a very slight protuberance above the upper anterior angle of the eye; the præorbital is $1\frac{2}{3}$ as long as high; there are six or seven series of scales on the præoperculum. Dorsal spines not elongate; the second anal spine rather longer, but not stronger, than the third, one-third of the length of the head; the pectoral reaches to the third anal spine, and is $4\frac{1}{2}$ in the total length. Silvery; back darker, with silvery specks, sometimes disappearing in preserved specimens.

New Zealand; Australian Seas. (Chinese Seas?)

a. Young. New Zealand. Presented by Sir J. Richardson.
b, *c*. Young. New Zealand. Presented by Sir J. Richardson.
d, *e*. Young. New Zealand. From the Haslar Collection.
f–*h*. Young. New Zealand. From the Haslar Collection.
i. Adult: bad state; has been in chloride of zinc. Sydney. Presented by Sir J. Richardson.
k. Fine specimen. Port Jackson. Collected by Mr. Macgillivray.
l. Skeleton. Port Jackson. Collected by Mr. Macgillivray.
m. Half-grown. Norfolk Island. Presented by Sir J. Richardson.
n. Half-grown. . Norfolk Island. Presented by Sir J. Richardson.
o. Adult: stuffed. Moreton Island (12 fathoms). Voyage of the Rattlesnake.
p. Adult: skin. Australia. Purchased of Mr. Warwick.
q, *r*. Adult: skins. Australia. Purchased of Mr. Gould.
s. Adult: bad state. Hong Kong? Presented by Sir J. Richardson.
t, *u*. Adult: skins. Cape of Good Hope? From Mr. Macgillivray's Collection.
v. Half-grown: skin.
w, *x*. Young. From the Haslar Collection.
y, *z*. Young. From the Haslar Collection.
α. Many young specimens. From the Haslar Collection.

Pagrus micropterus, established by Valenciennes from an apparently faulty drawing (Cuv. & Val. vi. p. 163), may prove to be identical with this species.

The following specimens probably belong to a different and unknown species; but being half-skins only, and deformed by stuffing, they do not admit of any satisfactory description. If we put aside their general form and their great size, they agree best with *P. unicolor*.

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* In young individuals equal to the length of the snout.

a, b. 29″ long: stuffed. Houtman's Abrolhos.
c, d. 22″ long: stuffed. Houtman's Abrolhos.
e, f. Half-grown: skins. Houtman's Abrolhos.

Skeleton.—The maxillary bone is of nearly equal width in the middle and at the extremities, and has the anterior edge slightly emarginate; the intermaxillary is joined to the posterior extremity of the former, and has the posterior processes of moderate length, rather shorter than the descending branch. The mandibulary is somewhat elevated, with a narrow free interspace between the articular and dentary pieces; there are four or five distinct openings of the muciferous channel, which runs along its lower surface. The head of the vomer is triangular, and has the anterior margins slightly swollen. The turbinal bones are very long, tubiform, broadest posteriorly, where they together form a suture, and divergent anteriorly, to receive the processes of the intermaxillaries. The præorbital is quadrangular, not much narrower posteriorly than anteriorly, and one-third longer than wide; the remainder of the infraorbital ring is narrow; there is a concave plate at its inside to support the eyeball from beneath, and joined to the entopterygoid by a hammer-like process. The axes of the limbs of the præoperculum form an obtuse angle; the angle of the margin is rounded. There runs a rather strong ridge parallel to the margins of the præoperculum, with a rudimentary muciferous channel and several distinct foramina. The operculum is irregularly quadrangular, with an interior ridge descending obliquely in a backward direction. The suboperculum is nearly vertically situated and pointed above; the interoperculum with the lower margin rounded. The frontal bones are rather flat, obliquely situated, their highest point being at their meeting with the occipital crest. The supraoccipital is horizontally situated, and has a high triangular crest, the upper margin of which is swollen. Of the lateral crests the outer one only is developed, and transformed into a very distinct channel with about five openings. The base of the skull is slightly compressed, and there is a wide cavity in the basisphenoid before the occipital joint. The pubic bones are of moderate length; each is formed by three lamellæ, the inner of which is broadest.

There are ten abdominal and fourteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·4. There are three spurious interneural spines in front, styliform; nearly all the others are dilated: the second is the longest, the following gradually decreasing in length. The first interhæmal is strong, and equal in length to the first seven vertebræ. Some of the ribs have epipleural spines.

There are four canine teeth in both jaws. The molars are of nearly equal size, and small; two series in the upper jaw. In the lower jaw they are arranged in two series on the middle part only standing in a single series anteriorly and posteriorly.

5. Pagrus major.

Chrysophrys major, *Temm. & Schleg. Faun. Japon. Poiss.* p. 71. pl. 35.

D. $\frac{12}{10}$. A. $\frac{3}{8}$. L. lat. 55. L. transv. 7/15.

The distance between the eyes equals their diameter, which is $1\frac{1}{2}$ in the length of the snout. The præorbital is $1\frac{1}{3}$ as long as high; a slight protuberance before the upper anterior angle of the eye. Limb of the præoperculum naked. Dorsal spines moderate, slightly compressed on one side: the fourth is the longest; the second anal spine rather stronger, but not longer than the third, which is one-third of the length of the head. Molars small, in two series, sometimes with a third of rudimentary teeth. Uniform reddish.

Japanese and Chinese Seas. (West coast of Australia?)

a. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
b. Half-grown. China.
c. Adult: stuffed. Japan.

6. Pagrus tumifrons.

Chrysophrys tumifrons, *Temm. & Schleg. Faun. Japon. Poiss.* p. 70. pl. 34.

D. $\frac{12}{11}$. A. $\frac{3}{10}$.

Nape very gibbous, the profile of the head descending abruptly; the height of the body is $2\frac{1}{2}$ in the total length. Eye large; the cleft of the mouth wide, extending to below the eye. Dorsal spines equal in strength, moderate; the second and third anal spines nearly equal. Uniform reddish. (*Schleg.*)

Japanese Sea.

B. Species with some of the dorsal spines flexible and elongate.

7. Pagrus cardinalis.

Sparus cardinalis, *Lacép.* iv. p. 141.
Chrysophrys cardinalis, *Cuv. & Val.* vi. p. 130; *Faun. Japon. Poiss.* p. 69. pl. 33: *Richardson, Ichth. China*, p. 241.

D. $\frac{12}{10}$. A. $\frac{3}{9}$.

The height of the body is $\frac{2}{5}$ths of the total length; a slight protuberance above the eyes. Molar teeth small, in two series, sometimes with a third series of rudimentary teeth. The first two dorsal spines very prominent, but much shorter than the third and fourth, which are elongate, filiform; the second and third anal spines equal. Reddish; back covered with small greyish specks.

Chinese and Japanese Seas.

a. Half-grown: stuffed: bad state. China. Presented by J. R. Reeves, Esq.

8. Pagrus auriga.

Pagrus bertheloti, *Valenc. in Webb & Berthel. Hist. Nat. Iles Canar. Poiss.* p. 33.
—— auriga, *Valenc. in Webb & Berthel. Hist. Nat. Iles Canar. Poiss.* p. 34; *Guichen. Explor. Scient. Algér. Poiss.* p. 49. pl. 4. f. 1.

D. $\frac{11}{11}$. A. $\frac{3}{8}$. L. lat. 50. L. transv. 6/15.

The greatest depth of the body is beneath the sixth dorsal spine, where it is $2\frac{2}{3}$ in tho total length; the diameter of the eye is one-fourth the length of the head. There are eight series of scales between the præorbital and the angle of the præoperculum. The length of the pectoral is $3\frac{1}{4}$ in the total; the third and fourth dorsal spines filiform, the former $\frac{3}{5}$–$\frac{4}{5}$ of the depth of the body. Red; back sometimes sparingly spotted with blue.

Canary Islands; Madeira; Mediterranean.

a. Skeleton. Madeira. Presented by the Rev. R. T. Lowe.
b. Half-grown. Orotava (Teneriffe). Presented by the Rev. R. T. Lowe.
c. Very fine specimen. Orotava. Presented by the Rev. R. T. Lowe. —These specimens do not show the cross-bands mentioned by Valenciennes.
d. Young: bad state; has been in chloride of zinc. From the Haslar Collection.—With brown cross-bands.

Pagrus bertheloti and *auriga* are the same fish according to the observations of the Rev. R. T. Lowe, the former representing old specimens of the latter. In specimen *c*, which is twelve inches long, the third dorsal spine also is more than one-half the height of the body, whilst in the fishes on which *Pagrus bertheloti* was founded, the length of the same spine is $2\frac{1}{2}$ in the height of the body.

9. Pagrus ehrenbergii.

Cuv. & Val. vi. p. 155.

D. $\frac{12}{10}$. A. $\frac{3}{9\ (C.\ \&\ V.\ 8)}$. L. lat. 54.

The height of the body is $3\frac{1}{3}$ in the total length. The first two dorsal spines short, but very conspicuously prominent between the scales; the third, fourth, and fifth spines elongate and filiform, the former of which is the longest, and sometimes reaches backwards to the soft portion of the fin. Red; back covered with blue spots.

Mediterranean.

a. Young. Coast of Africa. From the Haslar Collection.
b. Adult: stuffed: not good state.

10. Pagrus filamentosus.

Cuv. & Val. vi. p. 158.

D. $\frac{12}{10}$. A. $\frac{3}{8}$. L. lat. 54. L. transv. 6/15.

The height of the body is $2\frac{1}{2}$ in the total length, the length of the

head $3\frac{3}{4}$; the diameter of the eye is less than the distance between the eyes, one-third the length of the head, and $1\frac{1}{5}$ in that of the snout. There are five series of scales between the præorbital and the angle of the præoperculum. The first two dorsal spines very short, but projecting between the scales; the third very elongate, the fourth less; the fifth not flexible; the second anal spine stronger and longer than the third, $2\frac{1}{3}$ in the length of the head. Uniform red, shining golden; the spinous dorsal violet.

Sea of Mauritius.

a. Adult. Mauritius. From the Collection of the Zoological Society.

11. **Pagrus spinifer.**

Sparus spinifer, *Forsk.* p. 32; *L. Gm.* i. p. 1273; *Bl. Schn.* p. 281. *Russell,* ii. p. 1. pl. 101.
Pagrus spinifer, *Cuv. & Val.* vi. p. 156; *Rüpp. N. W. Fische,* p. 114.
—— longifilis, *Cuv. & Val.* vi. p. 159; *Bleek. Celeb.* iii. p. 756.

D. $\frac{12}{10}$. A. $\frac{3}{9}$. L. lat. 50. L. transv. 22.

The height of the body is $2\frac{1}{2}$ in the total length, the length of the head $4\frac{1}{2}$; the diameter of the eye is one-third of the latter. The first two dorsal spines very short [and the first not projecting from the scaly sheath of the fin?]; the third very elongate and filiform; some of the following spines flexible, and in some of the specimens also filiform, but shorter than the third; the second and third anal spines nearly equal. Uniform rose-coloured; the spinous dorsal black-edged.

Red Sea; East Indian Seas.

Rüppell has not found any pyloric appendages in this species.

a. Young. China.—A. $\frac{4}{8}$.

12. **Pagrus argyrops.**

Sparus argyrops, *Linn. Syst. Nat.* p. 471; *Shaw, Zool.* iv. p. 426; *Bl. Schn.* p. 277.
Schœpff, Schrift. Naturf. Freunde Berlin, viii. p. 153.
Sparus xanthurus, *Lacép.* iv. p. 120.
Labrus versicolor, *Mitch. Trans. Lit. & Phil. Soc. New York,* i. p. 404. pl. 3. f. 7.
Pagrus argyrops, *Cuv. & Val.* vi. p. 164; *Agassiz in Spix, Pisc. Brasil.* p. 117. tab. 64; *Dekay, New York Fauna, Fishes,* p. 95. pl. 9. f. 25; *Baird, Ninth Smithson. Report,* p. 333; *Holbr. Ichth. S. Carol.* p. 175. pl. 25. f. 1.

D. $\frac{12}{12}$. A. $\frac{3}{11}$. L. lat. 50. L. transv. 20–23.

The height of the body is $2\frac{2}{3}$ in the total length. Canine teeth feeble; molars very small, in two series. The second and third dorsal spines elongate, filiform, the third shorter than the second. Brownish, golden shining; a narrow, vertical, blackish spot in the middle of each side.

Atlantic coasts of the United States.

19. PAGELLUS*.

Pagellus, *Cuv. & Val.* vi. p. 169.

The anterior teeth card-like, without canines, the outer series generally containing larger ones than those behind. Several series of rounded molar teeth in both the jaws. Cheeks scaly. The spines of the dorsal (eleven to thirteen) can be received in a groove; three anal spines. Opercles not armed. Scales of moderate size. Six branchiostegals. Pyloric appendages in small number; air-bladder simple.

Mediterranean; Atlantic (except the shores of North America).

1. Pagellus erythrinus.

? Ἐρυθρίνος, *Aristot.* 10. cap. 11.

Erythrinus, *Bellon.* p. 185; *Rondel.* v. cap. 16. p. 144; *Salvian.* f. 239; *Aldror.* ii. cap. 9. p. 154; *Gesner*, p. 365; *Willughby*, c. 10. p. 311. tab. 5. f. 6; *Ray*, p. 134.

Sparus, no. 3, *Artedi, Genera*, p. 36.

Sparus erythrinus, *Linn. Syst.* i. p. 469; *L. Gm.* p. 1272; *Bl. Schn.* p. 275; *Shaw, Nat. Misc.* xx. pl. 834; *Risso, Ichth. Nice*, p. 240; *Martens, Reise nach Venedig*, ii. p. 425; *Duhamel, Pêches*, iv. c. 2. p. 29.

Sparus pagellus, *Lacép.* iii. p. 86.

Pagrus erythrinus, *Risso, Eur. Mérid.* iii. p. 361.

Pagellus erythrinus, *Cuv. & Val.* vi. p. 170. pl. 150; *Yarrell, Brit. Fishes*, i. p. 120, fig. cop. from *Cuv. & Val.* (not descript. and vignette; not *White*); *Nordm. in Demid. Voy. Russ. Mérid.* p. 388; *Guichen. Explor. Scient. Algér. Poiss.* p. 50; *Couch in Loudon's Mag. Nat. Hist.* v. p. 17. f. 3; *Parn. Fishes, Firth of Forth*, p. 43. pl. 27.

Pagellus rostratus, *Lowe, Trans. Zool. Soc.* ii. p. 177.

Pagrus vulgaris, *Yarrell, Brit. Fishes*, i. p. 117–119 (descript. and vignette, but not figure and synonymy, which belong to the true *Pagrus vulgaris*); *White, Catal. Brit. Fishes*, p. 17 (not synon.).

Pagellus canariensis, *Valenc. in Webb and Berthelot, Hist. Nat. Iles Canar. Poiss.* p. 35. pl. 10. f. 2.

D. $\frac{12}{10}$. A. $\frac{3}{9}$. L. lat. 60. L. transv. $\frac{6-7}{16}$. Cæc. pylor. 4. Vert. 10/14.

The height of the body is $3\frac{1}{4}$ in the total length, the length of the head $3\frac{1}{2}$; the diameter of the eye equals the distance between the eyes, and is $3\frac{2}{3}$ in the length of the head and $1\frac{1}{2}$ (twice in large specimens) in that of the snout. The præorbital is $1\frac{1}{2}$ or $1\frac{1}{3}$ as long as high, with the maxillary edge slightly notched (in adult specimens). There are six series of scales between the præorbital and the angle of the præoperculum. In both jaws two series of molars only. The posterior nostril ovate. Uniform red.

Mediterranean; Black Sea; coasts of the Peninsula, of France and Great Britain; Canary Islands. [Cape Seas?]

a. 19″ long: stuffed. Firth of Forth. From Dr. Parnell's Collection.

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* 1. Pagellus breviceps, *Cuv. & Val.* vi. p. 199.—Mediterranean

b. 21″ long: skin: not good state. Brixham. From Mr. Yarrell's Collection (cfr. Yarrell, *Brit. Fish.* pp. 117, 118).
c. 20″ long: stuffed. Plymouth. Presented by Lieut. H. F. Spence, R.N.
d–f. 20″ long: skins. Plymouth. From Mr. Yarrell's Collection.
g. 20″ long: skin. Devonshire. From Mr. Yarrell's Collection.
h. Half-grown. Lisbon.
i. Half-grown: stuffed. Lisbon. Presented by G. Hough, Esq.
k. Fine specimen. Orotava. Presented by the Rev. R. T. Lowe.
l. Adult: stuffed. Santa Cruz (Teneriffe).
m. Half-grown. Adriatic. Purchased of Mr. Frank.
n. Half-grown. Mouth of the Danube.
o, p. Adult: skins. From Mr. Yarrell's Collection.
q. Adult: skins. From the Collection of the Zoological Society.
r. Half-grown: bad state. From the Haslar Collection.
s. Half-grown: stuffed.
t, u. Young: skins: not good state. From Mr. Yarrell's Collection.
v. Young: not good state. Purchased of Mr. Warwick.
w. Adult: skeleton.

There is an important error in Valenciennes' description of this fish, by which some of the confusion among the Sparoid fishes in Yarrell's work may have originated. Valenciennes attributes eight anal rays to this fish (p. 176), whilst the figure (pl. 150) correctly represents nine. All the European specimens that I have examined invariably exhibited the same number, viz. nine, and by this character alone *Pagellus erythrinus* may be readily distinguished from *Pagrus vulgaris,* which has constantly eight only. I have seen a single specimen of *P. erythrinus,* which formed an exception in having *ten* anal rays; but this came from the Cape, and may prove to be a separate species.

Thus, even without having the original specimens from Yarrell's Collection, one could easily see that the description and the vignette representing the dentition, which Yarrell has given in the article on *Pagrus vulgaris,* were taken from specimens of *Pagellus erythrinus.*

The article on the fish which he has described under the name of *Pagellus erythrinus* is composed of several elements. The figure, above all, is a copy, taken from the *Hist. Nat. Poiss., Cuv. & Val.,* pl. 150, and, so far, there is no mistake about the fish; but with regard to the rest, cfr. *Pagellus owenii,* p. 478 of this Catalogue.

Finally, there are two other specimens in the British Museum Collection, which, perhaps, are types of separate species; but in a group where it is necessary to prove the constancy of the distinctive characters, and where the species are so difficult of recognition, I think it better to refrain from establishing species upon doubtful characters.

VAR.? Spec. nov.?

x. Twenty-three inches long: skin. South Devon. From Mr. Yarrell's Collection.—Molars in both jaws irregularly arranged, and giving the appearance of three series. I observe that this specimen is *not* the type, either of the description given by Yarrell of *Pagellus erythrinus*, or of the vignette.

VAR.? Spec. nov.?

y. Adult: stuffed. Cape Seas. From Sir A. Smith's Collection.—Anal with ten soft rays.

Skeleton.—The maxillary bone is compressed, oblong, with a groove near its posterior extremity for the articulation with the extremity of the intermaxillary; there is another longitudinal groove at its upper extremity for the articulation with the palatine bone. The intermaxillary is stout, joined to the maxillary, and has the posterior process rather longer than the descending branch, but not reaching to the vertical from the orbit. The mandibula is stout, and there is no free space between the dentary and articular bones; five pores lead into the rudimentary muciferous channel running at its lower surface. The anterior part of the vomer is broad, flat, subtriangular; the posterior is continued into the sharp crest of the basisphenoid. The palatine bones are crescent-shaped, and situated nearly vertically; their upper portion is bent forwards, reaching as far as the turbinal bone, and is joined to the maxillary. The turbinal bones are long, tubiform. The præorbital is longer than high, slightly concave at the maxillary margin; from its inner side arises a plate to support the eyeball from beneath. The remainder of the infraorbital arch is narrow, muciferous. There are three singular conical cavities at the upper surface of the skull: a single one between the posterior extremities of the turbinal bones, and another on each side, above the anterior angle of the orbit. The frontal bones are truncated anteriorly, with the upper surface slightly convex, roughened by pores and grooves. The occipital crest is rather stout, and, with two others on each side, well developed; the external is muciferous. The brain-capsule is very slightly swollen on each side; the basisphenoid has a large opening before the occipital joint, and is compressed to a sharp ridge, obliquely ascending to the vomer. The præoperculum has an obtuse and strong ridge, with the muciferous channel very rudimentary; the horizontal limb is shorter than the vertical; the angle and the lower margin are striated, the striæ not terminating in points. The operculum is nearly twice as high as wide, irregularly quadrangular, with the posterior side slightly emarginate and the lower angle much produced downwards; its inner surface is furnished with an oblique bony ridge. The suboperculum is obliquely situated, the interoperculum nearly horizontally. The pubic bones are of moderate length; each is formed by three lamellæ, the interior of which are joined together, without free space between; the outer one is much less developed, and situated nearly in the same plane with the interior; the anterior extremities of the bones diverge.

There are ten abdominal and fourteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·47. The first spurious interneural spine has a strong spine, pointing forwards; the other interneurals are much dilated, and in immediate contact with one another. The first interhæmal is of moderate length and strength. Some of the ribs have long epipleural spines.

The teeth of the anterior portion of the jaws form a villiform band, with an outer series of rather stronger ones; posteriorly they assume a more granular character, and pass finally into two series of moderate molars, the larger of which are placed in the inner series. The new teeth, replacing the old ones, are developed below, and protected by, the latter.

2. Pagellus centrodontus.

Orphus, *Rondel.* v. cap. 25. p. 157; *Aldrov.* ii. cap. ii. p. 158.
Pagrus, *Aldrov.* p. 151.
Sparus orphus, *Lacép.* iv. p. 146.
—— pagrus, *Penn. Brit. Zool.* iii. p. 212. pl. 42; *Bl.* taf. 267; *Bl. Schn.* p. 271; *Turton, Brit. Faun.* p. 98.
—— aurata, *Don. Brit. Fishes*, iv. pl. 89; *Turton, Brit. Faun.* p. 97. *Duhamel*, ii. sect. 4. cap. 2. p. 30.
Sparus centrodontus, *De la Roche, Ann. Mus.* xiii. p. 345. pl. 23. f. 2.
—— massiliensis, *Risso, Ichth. Nice*, p. 247, and *Eur. Mérid.* p. 357.
Pagrus vulgaris, *Flem. Brit. An.* p. 211.
Pagellus centrodontus, *Cuv. & Val.* vi. p. 180; *Parn. Fishes Firth of Forth*, p. 46. pl. 27; *Yarrell, Brit. Fishes*, i. p. 123; *Webb & Berthel. Hist. Nat. Iles Canar. Poiss.* p. 34. pl. 7. fig. 3; *Guichen. Explor. Sc. Alger. Poiss.* p. 50.

D. $\frac{12}{12}$. A. $\frac{3}{12}$. L. lat. 75. L. transv. 7/16. Cæc. pylor. 4. Vert. 10/14.

The height of the body is $2\frac{3}{4}$ to $3\frac{1}{4}$ in the total length, the length of the head $3\frac{1}{2}$; the diameter of the eye is rather more than the distance between the eyes, equal to the length of the snout and $3\frac{1}{2}$ in that of the head. The præorbital is much narrower posteriorly than in front, and not notched. There are seven series of scales between the præorbital and the angle of the præoperculum. Teeth very fine, intermixed posteriorly with minute molars, more or less irregularly arranged. The pectoral reaches to the origin of the anal. Silvery, back rose-coloured; a large black blotch on the shoulder.

Mediterranean; Canary Islands; coasts of the Peninsula, France, and Great Britain; North Sea.

a. Adult: stuffed. Firth of Forth.
b. Adult: stuffed. Firth of Forth. From Dr. Parnell's Collection.
c. Adult: skin. South Devonshire. From Mr. Yarrell's Collection.
d. Adult: bad state; has been in chloride of zinc. English coast. Presented by Mr. E. Gerrard.
e. Adult: stuffed. English coast.
f. Adult: skin. English coast. From Mr. Yarrell's Collection.
g. Half-grown: skin. English coast. From Mr. Yarrell's Collection.
h. Very large and fine specimen. Lanzarote. Presented by the Rev. R. T. Lowe.

i. Adult: not good state.
k. Adult: stuffed. From Mr. Yarrell's Collection.
l. Half-grown: skin. From Mr. Yarrell's Collection.
m, n. Half-grown: stuffed.
o. Half-grown: bad state: stuffed.
p. Adult: skeleton: not good state.

Monstrosity? 13 inches long and $5\frac{1}{2}$ inches high; the pectoral reaches far beyond the origin of the anal. (See figure given by Yarrell.)

q. Polperro. Presented by J. Couch, Esq.

Skeleton.—The maxillary bone is oblong, with the anterior margin nearly straight, and with the posterior convex and provided with a notch; the articular groove in which the palatine bone moves is very shallow; the articulation with the intermaxillary is near its lower extremity. The intermaxillary is moderately strong, with the posterior process shorter than the descending branch. The mandibula somewhat elevated; there is a free space between the dentary and articular bones; five or six small openings lead into the rudimentary muciferous channel. The head of the vomer is very broad, flat, triangular, whilst the posterior part tapers and passes into the sharp ridge of the basisphenoid. The palatine bones are narrow, situated in a nearly vertical direction; they terminate superiorly in a process, rectangularly bent forwards for the junction with the maxillary bone, and reaching as far as the turbinal bone. The nasal (ethmoid) is rather elongate, with two longitudinal impressions, in which are received the processes of the intermaxillary bones. The turbinal bones are provided with irregular grooves and cavities, and widened at both extremities. The præorbital is twice as long as wide, whilst the remainder of the infraorbital ring is very narrow; from the inside of the præorbital arises a comparatively small plate to support the eyeball from beneath. The frontal bones are truncated anteriorly; their upper surface is slightly convex, and roughened by pores and grooves. The occipital crest is moderate, and does not extend on the frontal bones; the two lateral crests, and especially the outer one, are comparatively much more developed. The brain-capsule is slightly compressed; the basisphenoid has the usual large opening before the occipital joint, and is compressed anteriorly into a sharp ridge. The præoperculum has a very low ridge, and the muciferous channel is consequently rudimentary: the horizontal limb is shorter than the vertical; both meet at a rounded angle, which, like the whole margin, is entirely smooth. The operculum is twice as high as wide, irregularly quadrangular, with the upper side oblique, the posterior curved, and with an acute lower angle; there is an oblique bony ridge at its inner surface. The suboperculum is nearly vertically situated; the interoperculum broad, with the lower margin rounded. The pubic bones are of moderate length; each is formed by three lamellæ, the outer of which is the most feeble, and situated nearly in the same plane with the interior; both the bones diverge anteriorly.

There are ten abdominal and fourteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·24. The three spurious interneurals are not spiniferous; the first interhæmal is of moderate length and strength.

3. **Pagellus owenii.**

Pagellus acarne, (not *Cuv.*) *Parn. Fishes Firth of Forth*, p. 24. pl. 27; *Yarrell, Brit. Fishes*, i. p. 122* (fig. not accurate); *White, Cat. Brit. Fishes*, p. 19.

Pagellus erythrinus, *Yarrell, l. c.* p. 120, descr. and vignette [not fig. or synon.].

D. $\frac{12}{11}$. A. $\frac{3}{10}$. L. lat. 68. L. transv. 6/13.

The height of the body equals the length of the head and is $3\frac{2}{3}$ in the total; the diameter of the eye is nearly equal to the distance between the eyes, $1\frac{1}{3}$ in the length of the snout, and $4\frac{1}{2}$ in the length of the head. The præorbital is narrower posteriorly, its greatest depth being about $1\frac{1}{2}$ in its greatest length. There are three series of molars in the upper jaw and two or three in the lower. Silvery red, with a dark violet spot in the axil.

Only known at present from the coasts of the British Isles.

a, b. Fourteen inches long. skins. Plymouth. From Mr. Yarrell's Collection.

c. Fourteen inches long: stuffed. Firth of Forth. From Dr. Parnell's Collection.

d. Fourteen inches long: stuffed.

e, f. Fourteen inches long: skins. From Mr. Yarrell's Collection.

Description.—This fish, known to British ichthyologists under the name of the "Axillary Bream," has been confounded by them with the *Acarne* of the Mediterranean, which appears to spread to the southern coasts of England in a few instances only. Both fishes are very similar to each other; but the British species has constantly three series of molars in the upper jaw, whilst the southern specimens exhibit two only, as is stated by Cuvier and confirmed by the specimens in the British Museum. If there is any irregularity in the arrangement of the series of the upper molar teeth, and therefore a doubt about their number, they appear to form four series rather than three, and never two.

I have mentioned above that the article on *Pagellus erythrinus* in 'Yarrell's Fishes' treats of a different species, except the figure, which is a copy, as acknowledged by himself. That part of the description which is composed by himself, contains very few specific characters which might not be attributed to other *Sparidæ* as well as to the species in question. But there is one sentence which clearly shows that Yarrell could not have had a specimen of *Pagellus erythrinus* for this description, as he professes; he says, p. 122, "The last two or three soft rays of both dorsal and anal fins are invested together in one scaly covering." This is the case in *P. owenii* and in *P. acarne* from the Mediterranean, but not in *Pagellus ery-*

thrinus. And if we consider, together with this character, the vignette of the same page, representing the molar teeth of the upper jaw in three regular series, as in *P. owenii*, and never in *P. erythrinus* or *P. acarne*, we cannot have any doubt that this description and this vignette were taken from specimens of *P. owenii*.

One point only appears to contradict this view, namely the formula of the fins, in which Yarrell attributes eight soft rays to the anal. But I have stated above that there is a misprint in this very number in the *Hist. Nat. Poiss.*, and Yarrell in reproducing it clearly shows that he copied the formula from that work, in order to bring his description more into accordance with that of a work which he appears to have considered as infallible. Thus, Yarrell not only confounds four species of fish, but increases this confusion by publishing figures and descriptions of them, part of which are taken from the work of a better informed author, and part from specimens totally distinct from the one intended to be described.

The fish from which Yarrell has taken his article on *P. erythrinus* is again described under the name of "Axillary Bream," p. 122*. The article on that fish is merely a reproduction of Dr. Parnell's observations; it is, as stated above, different from the *Acarne* of the Mediterranean, and I have named it in honour of Prof. R. Owen.

The general form is very much like that of *P. acarne*. The head is one-third of the total length, without caudal; the snout appears to be rather more elongate, the distance between the extremity of the snout and the lower posterior angle of the præorbital being $2\frac{2}{5}$ in the length of the head. There are five series of scales on the cheek. A large crescent-shaped space on the angle of the præoperculum is naked.

The anterior teeth in both jaws are villiform, the outer series being formed by somewhat larger but equal teeth. Further posteriorly the teeth become granular, and, gradually assuming the character of molars, they form three regular series in the upper jaw; each series contains six or seven molars, and they are all of nearly equal size, except the last two of the inner series, which are one-third larger than those around them. The lower jaw is generally armed with two series only, but occasionally the inner series is broken up in the middle, forming a third series, which, however, does not extend so far as the others; each series contains six or seven molars, and the posterior ones of the inner series are nearly twice as large as the others.

The body is rather thick, and its greatest depth is $3\frac{2}{3}$ in the total length.

The spines of the fins are rather slender; the fourth of the dorsal fin is the longest and $2\frac{2}{3}$ in the length of the head; the soft dorsal is much lower. Caudalis forked.

The scales are somewhat irregularly arranged, especially on the anterior portion of the trunk nearest to the head; the posterior margin of most of them has a more or less distinct notch in its upper half. The lateral line is slightly curved, and runs parallel to the back.

	inches.	lines.
Total length	14	6
Length of the head	4	3
Height of the body	4	0
Diameter of the eye	1	0
Length of the fourth dorsal spine	1	6

4. Pagellus acarne.

? Ἄκαρνα, *Athen.* viii. cap. 13.
? Acarne, *Plin.* xxxii. cap. 11.
Acarne, *Rondel.* xv. cap. 20. p. 151; *Duhamel, Pêches,* ii. sect. iv. c. 2. p. 32.
Sparus berda, *Risso, Ichth. Nice,* p. 252.
Pagrus acarne, *Cuv. Règne Anim.*; *Risso, Eur. Mérid.* iii. p. 361.
Pagellus acarne, *Cuv. & Val.* vi. p. 191; *Cuv. Règne Anim. Ill. Poiss.* pl. 35. f. 1; *Guichen. Explor. Scient. Algér. Poiss.* p. 51.

D. $\frac{12}{11}$. A. $\frac{3}{10}$. L. lat. 72. L. transv. 5/13. Vert. 22.

The height of the body equals the length of the head, and is $3\frac{2}{3}$ in the total; the diameter of the eye is nearly equal to the distance between the eyes, rather less than the length of the snout, and $3\frac{1}{2}$ in the length of the head. The præorbital is narrower posteriorly, its greatest depth being $1\frac{1}{2}$ in its greatest length. There are five series of scales between the præorbital and the angle of the præoperculum. In both jaws two series of molars only. Reddish, shining golden; a deep brownish-red spot in the axil.

Mediterranean; from the Canary Islands to the coasts of Great Britain.

a. Fine specimen. Lanzarote. Presented by the Rev. R. T. Lowe.
b. Half-grown. Lisbon.
c. Half-grown. Cornwall. Museum Leach.

5. Pagellus bogaraveo.

Sparus bogaraveo, *Brünn. Pisc. Mass.* p. 49; *Lacép.* iv. pp. 111, 112; *Risso, Ichth. Nice,* p. 249.
Pagrus bugaravella, *Risso, Eur. Mérid.* p. 359.
Duhamel, Pêches, sect. 4. pl. 1. f. 1.
Pagellus bogaraveo, *Cuv. & Val.* vi. p. 196.

D. $\frac{12-13}{12-11}$. A. $\frac{3}{11-12}$. L. lat. 70. L. transv. 7/14. Vert. 22.

The height of the body equals the length of the head, and is $3\frac{2}{3}$ in the total; the diameter of the eye is a little more than the distance between the eyes or than the length of the snout, and is one-third of the length of the head. The præorbital is rather narrow and elongate, its greatest depth being $2\frac{1}{3}$ in its length There are six series of scales between the præorbital and the angle of the præoperculum. In both jaws two series of small molars. Silvery, back rose-coloured.

From the Mediterranean to the British Channel.

a. Adult. Cadiz. From the Haslar Collection.
b. Adult: skin. Mediterranean. From the Collection of the Zoological Society.

6. Pagellus mormyrus.

Μόρμυρος, *Aristot.* vi. cap. 17; *Athen.* vii. p. 313.
Μόρμυλος, *Oppian*, i. v. 100.
Mormyrus, *Plin.* xxxii. cap. 11; *Bellon.* p. 183; *Rondel.* v. c. 22. p. 153; *Salv.* f. 184; *Gesner*, p. 547; *Aldrov.* ii. c. 19. p. 184; *Willughby*, p. 329; *Ray*, p. 134.
Sparus, no. 9, *Artedi*, *Genera*, p. 37.
Sparus mormyrus, *L. Syst. Nat.* p. 472; *Brünn. Pisc. Mass.* p. 96 *L. Gm.* p. 1279; *Bl. Schn.* p. 277; *Martens, Reise nach Venedig* ii. p. 425.
Pagrus mormyrus, *Geoffr. Descr. Eg. Poiss.* pl. 18. f. 3.
Pagellus mormyrus, *Cuv. & Val.* vi. p. 200; *Webb & Berthelot, Hist Nat. Iles Canar. Poiss.* p. 35; *Guichen. Explor. Scient. Algér. Poiss* p. 51.
Pagellus goreensis, *Cuv. & Val.* vi. p. 203.
—— pernambucensis, *Cuv. & Val.* vi. p. 210.

D. $\frac{11}{12}$. A. $\frac{3}{10}$. L. lat. 63–65. L. transv. 6/12–14. Vert. 10/14.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $3\frac{3}{4}$; the diameter of the eye is one-fifth of the length of the head, $2\frac{1}{3}$ in that of the snout, and $1\frac{1}{3}$ in the distance between the eyes. The mouth is very protractile, and the upper maxillary bent, with the concavity downwards and forwards. The molar teeth in four series in the upper jaw, and in two or three in the lower. Silvery, shining golden, with seven narrow blackish cross-bars, and sometimes with seven other more indistinct ones between.

Mediterranean; Canary Islands; North-west coast of Africa; Atlantic coasts of Tropical America.

a. Fine specimen. Lanzarote. From the Collection of the Rev. R. T. Lowe.
b. Adult: not good state. Sicily. Presented by W. Swainson, Esq
c, *d*. Young. Malta. From the Haslar Collection.
e. Half-grown. Dalmatia.
f. Half-grown: skin. Mediterranean. From the Collection of the Zoological Society.
g. Half-grown: skin: bad state. From Mr. Yarrell's Collection.
h. Young: skin. From Mr. Yarrell's Collection.
i. Adult: bad state. (Cape of Good Hope?) From the Haslar Collection.
k. Adult: skeleton. From the Haslar Collection.

In all the specimens I found the number of the dorsal spines and the dentition as stated by Valenciennes for *P. goreensis*, which, I have no doubt, is identical with *P. mormyrus*.

The following South American specimens, probably identical with *Pagellus pernambucensis*, do not differ from those of the other side of the Atlantic Ocean.

l, *m*. Half-grown. St. Vincent. From Mr. Macgillivray's Collection.
n. Half-grown: skeleton. St. Vincent. From Mr. Macgillivray's Collection.

Skeleton.—I cannot agree with Valenciennes' view, that the skeleton of this fish does not offer any remarkable peculiarity. The maxillary bone is crescent-shaped, with the anterior side emarginate and both extremities narrowest. The intermaxillary is broad, shorter than the maxillary, and *its extremity forms an articulation with the anterior side of the latter*; the posterior processes are broad, very elongated, much longer than the descending branch of the bone; they do not reach to the vertical from the orbit. The mandibula is very stout, and there is no free space between the dentary and articular bones. The anterior portion of the vomer forms a very broad and concave plate. The palatine bones are crescent-shaped, and situated in a nearly vertical direction; their upper portion is much developed, bent forwards, reaching as far as the turbinal bone, and joined to the maxillary. The nasal (ethmoid) is very elongate, with two longitudinal impressions, in which are received the processes of the intermaxillary bones. *The turbinal bones are exceedingly long and tubiform.* The præorbital is much longer than high, whilst the remainder of the infraorbital ring is very narrow: from the inside of the præorbital arises a broad plate, *supported by a strong process, which is attached to the entopterygoid.* The frontal bones slightly diverge anteriorly to receive the extremity of the nasal; their upper surface is roughened by pores and grooves. The occipital crest, with two others on each side, is moderately elevated. The brain-capsule is slightly compressed; the basisphenoid has a large opening before the occipital joint, and its anterior portion is compressed into a ridge. The præoperculum has an obtuse and strong ridge, with the muciferous channel very rudimentary; the horizontal limb is much shorter than the vertical; the angle is rounded and striated, the striæ not terminating in points. The operculum is twice as high as wide, quadrangular, with the upper side oblique; its inner surface is furnished with an oblique bony ridge terminating in an obtuse point. The suboperculum is nearly vertically situated, the interoperculum obliquely. The glossohyal is styliform, the urohyal triangular, with the posterior side notched. The lower pharyngeal bones are very elongate, with both the extremities pointed. The pubic bones are of moderate length; each is formed by three lamellæ, the interior of which is broadest.

There are ten abdominal and fourteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·33. The first interhæmal is of moderate strength and length. Some of the ribs have long epipleural spines.

The *teeth* of the anterior portion of the upper jaw form a villiform band, with an outer series of rather stronger ones. The two outer bands of the molars contain small teeth, which are somewhat irregularly arranged. The molars of the third series, nine in number, gradually become larger posteriorly; the fourth series extends to one-half only of the length of the third, and has small molars; there are, finally, granular teeth, forming two oblique and short series. The anterior teeth of the lower jaw are equal, short, and cardiform; there are two series of molars in the posterior portion of the jaw, those of the inner one being large and broad; this series is anteriorly double, containing teeth equal to those of the outer one. The pharyngeal teeth are cardiform.

The comparison of the skeletons of European and West Indian specimens proves the identity of *Pagellus pernambucensis* with *P. mormyrus.*

7. Pagellus lithognathus.

Cuv. & Val. vi. p. 204. pl. 151.

D. $\frac{11}{10}$. A. $\frac{3}{8}$. L. lat. 43–50. L. transv. 5/13. Vert. 22.

Adult.—The height of the body is $4\frac{1}{2}$ in the total length; the diameter of the eye is seven times in the length of the head, and $3\frac{1}{2}$ in that of the snout. The upper maxillary bone (of adult specimens) is very thick, swollen, and hard like stone. The molar teeth in the upper jaw form a band, and are irregularly arranged; three series in the lower. Uniformly coloured.

Cape of Good Hope.

a. Thirty-six inches long: stuffed.

Young.—The height of the body is nearly equal to the length of the head, and about $3\frac{3}{4}$ in the total; the diameter of the eye is one-fifth of the length of the head, about one-half of that of the snout, and $1\frac{1}{3}$ in the distance between the eyes. The mouth is very protractile and the upper maxillary bent, with the concavity downwards and forwards, but not swollen. The molar teeth are rather small, arranged in three regular series in the upper jaw, and in one complete or in two incomplete series in the lower. The dorsal spines are moderate, slightly compressed on one side; the fourth, fifth and sixth are longest, their length being equal to the distance between the third and seventh spines. Coloration uniform (in a dried state); in life with five brownish cross-bands.

b. $9\frac{1}{2}''$ long: stuffed. Cape Seas. Presented by Sir A. Smith.
c. 10″ long: skin. From Gronov's Collection.

20. CHRYSOPHRYS*.

Chrysophrys, *Cuv. Règne Anim.*; *Cuv. & Val.* vi. p. 81.

Four or six conical canine teeth and three or more series of rounded molar teeth in both jaws. Cheeks scaly. The spines of the dorsal (eleven or twelve) can be received in a groove; three anal spines. Scales of moderate size. Six branchiostegals. Pyloric appendages in small number; air-bladder sometimes notched, or with very short appendages.

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* 1. Sparus bilobatus, *Lacép.* iv. p. 141.—Chrysophrys bilobata, *Cuv. & Val.* vi. p. 125.—From a drawing.
2. *Renard*, fol. 21. no. 214.—Chrysophrys coracinus, *Cuv. & Val.* vi. p. 133. —Ile de France.
3. Sparus fuscescens, var., *Lacép.* iii. pl. 17. f. 3.—Chrysophrys madagascariensis, *Cuv. & Val.* vi. p. 135.—From a drawing.
4. Sparus annularis, *Bl.* taf. 271.—Chrysophrys annularis, *Cuv. & Val.* vi. p. 139.—Perhaps an imaginary species.
5. Sparus forsteri, *Bl. Schn.* p. 282.—Chrysophrys forsteri, *Cuv. & Val.* vi. p. 140.—Pacific.

Round the coasts of Africa; Indian Ocean; East Indian Seas. Pacific; Atlantic coasts of the United States.

1. **Chrysophrys aurata.**

Χρύσοφρυς, *Aristot.* i. c. 5, ii. c. 17, iv. c. 10, v. c. 10, vi. c. 17, viii. c. 2, 13, 15, 19; *Athen.* vii. p. 328; *Ælian*, xiii. c. 28, xvi. c. 12; *Oppian*, i. p. 7.
Aurata, *Columell.* viii. c. 16; *Plin.* ix. c. 16; *Bellon.* pp. 192, 193; *Rondel.* v. c. 2. p. 115; *Salvian*, fol. 174. b. 175; *Gesner*, pp. 110, 128; *Willughby*, p. 307. tab. 5. fig. 5; *Ray*, p. 131.
Aurata vulgaris, *Aldrov.* ii. c. 15. p. 171.
Sparus, no. 1, *Artedi, Genera*, p. 35; *Gronov. Mus. Ichthyol.* p. 38. no. 90.
Sparus aurata, *L. Syst. Nat.* i. p. 467; *Hasselq. Iter Palest.* p. 337; *L. Gm.* p. 1270; *Bl.* taf. 266?; *Bl. Schn.* p. 270; *Risso, Ichthyol. Nice*, p. 234; *Brünnich, Pisc. Mass.* p. 36; *Lacép.* iv. p. 57; *Martens, Reise nach Venedig*, ii. p. 424.
Duhamel, Pêches, ii. sect. 4. pl. 11. f. 1.
Mochar, *Osbeck, Nov. Act. Nat. Cur.* iv. p. 100.
Sparus scriptus, *Bl. Schn.* p. 279.
Chrysophrys aurata, *Cuv. & Val.* vi. p. 85. pl. 145; *Guichen. Explor Scient. Algér. Poiss.* p. 48; *Yarrell, Brit. Fishes*, i. p. 111; *White, Catal. Brit. Fishes*, p. 17 *.

D. $\frac{11}{13}$. A. $\frac{3}{11}$. L. lat. 76. L. transv. 8/17. Cæc. pylor. 4. Vert. 10/14.

The height of the body is $3\frac{1}{3}$ in the total length, the length of the head four times; the distance between the eyes is rather more than their diameter, which is $1\frac{2}{3}$ in the length of the snout. The præorbital is $1\frac{1}{2}$ as long as high; a slight protuberance above the upper anterior angle of the eye. Dorsal spines moderate, of equal strength; the second and third anal spines nearly equal in size, one-fourth of the length of the head. The spinous portion of the dorsal conspicuously higher than the soft. Back bluish, belly silvery; a dark violet blotch above the angle of the operculum; a bright yellow band between the eyes.

Mediterranean; western shores of the Peninsula and of France. Occasionally southern shores of England.

a. Adult. Dalmatia.
b. Half-grown. South Devonshire. Museum Leach.
c. Adult: stuffed. English coast.

2. **Chrysophrys crassirostris.**

Cuv. & Val. vi. p. 98. pl. 146.

D. $\frac{11}{13}$. A. $\frac{3}{11}$. L. lat. 85.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the

head four times; the distance between the eyes is more than their diameter. Dorsal spines rather feeble, of equal strength; the spinous portion of the fin not, or scarcely higher than the soft; the second anal spine rather stronger than the third, 4½ in the length of the head. Back bluish, belly silvery; body striped; a large black blotch above the angle of the operculum; a bright yellow band between the eyes. (*Val.*)

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* The skin, mentioned by Mr. White as in the Collection of the British Museum, was afterwards referred by him to *Pagrus orphus*.

Mediterranean.

3. Chrysophrys globiceps.

Cuv. & Val. vi. p. 100.

D. $\frac{12}{11}$. A. $\frac{3}{11}$.

Closely allied to *Chrysophrys aurata*.

The præorbital is not so high. Dorsal spines rather feeble, of equal strength. Back bluish, belly silvery; a blackish blotch above the angle of the operculum; a bright yellow band between the eyes. Young individuals with three or four cross-bands, each formed by a double series of black points. (*Val.*)

Cape of Good Hope.

4. Chrysophrys cæruleosticta.

Cuv. & Val. vi. p. 110; *Webb & Berthelot, Hist. Nat. Iles Canar.* p. 31. pl. 6. f. 2.

D. $\frac{12}{11}$. A. $\frac{3}{9}$. L. lat. 50. Cæc. pylor. 4.

The height of the body is one-third of the total length; the diameter of the eye is one-fourth of the length of the head, and 1½ in the distance between the eyes. The upper profile, between the dorsal fin and the snout, forms a quarter of a circle; the crown is slightly convex. Præoperculum with three series of scales. Incisors conical, strong; four series of molars in the upper jaw, three in the lower; no single large molar. The third dorsal spine longest, three-sevenths of the height of the body; pectorals very long, extending to the fourth soft ray of the anal. Red, shining golden; back with small blue spots arranged in four or five series; a yellow band between the eyes; dorsal fin minutely dotted with blackish.

North-west coast of Africa.

According to the statement of Valenciennes, the air-bladder is furnished with a great number of short and obtuse appendages on each side.

5. Chrysophrys laticeps.

Cynædus, sp., *Gronov. Zoophyl.* no. 213.

Chrysophrys laticeps, *Cuv. & Val.* vi. p. 122; *Cuv. Règne Anim. Ill. Poiss.* pl. 34. f. 2.

Perca leonina, *Gronov. Syst. ed. Gray*, p. 113.

D. $\frac{11-12}{11-10}$. A. $\frac{3}{8}$. L. lat. 65. L. transv. 8/17. Vert. 10/14.

The height of the body is 2¾ in the total length, the length of the head $3\frac{2}{3}$. The upper profile of the neck is slightly parabolic, and that of the head straight, obliquely descending. The space between the eyes is very slightly convex, and equal to $1\frac{1}{3}$ diameter of the eye; the length of the snout is twice this diameter. The præorbital is $1\frac{1}{3}$ as long as high, and covers the maxillary bone nearly entirely. There are twelve series of scales between the præorbital and the interior ridge of the præoperculum, the limb of which is entirely covered with scales. In both jaws one series of larger molars only; interiorly with a band of granular molar teeth irregularly arranged. Dorsal spines moderate, compressed on one side; the second and third anal spines nearly equal, and $3\frac{1}{2}$ in the length of the head. Reddish.

Cape Seas.

a. Adult: stuffed.
b. Half-grown: stuffed.
c. Half-grown: stuffed: not good state. Cape Seas. Presented by Sir A. Smith.
d. Half-grown: skin. False Bay.
e. Adult: skin. From Gronov's Collection.

6. Chrysophrys cristiceps.

? Chrysophrys cristiceps, *Cuv. & Val.* vi. p. 132.

D. $\frac{12}{10}$. A. $\frac{3}{8}$. L. lat. 60. L. transv. 9/22.

The space between the head and the origin of the dorsal fin is elevated, and the height of the body beneath this space is $2\frac{3}{4}$ in the total length, the length of the head $3\frac{2}{3}$. The space between the eyes is very convex, and equal to $1\frac{1}{3}$ diameter of the eye; the length of the snout is twice this diameter. The præorbital is rather longer than high, and covers the maxillary bone nearly entirely. There are ten series of scales between the præorbital and the interior ridge of the præoperculum, the limb of which is entirely covered with scales. In both jaws one series of larger molars only; interiorly with a band of granular molar teeth irregularly arranged. Dorsal spines moderate, compressed on one side; the second and third anal spines nearly equal, and $3\frac{1}{2}$ in the length of the head. Reddish, irregularly marbled with greyish.

Cape Seas.

a. Adult: stuffed.

7. Chrysophrys gibbiceps.

Chrysophrys gibbiceps, *Cuv. & Val.* vi. p. 127. pl. 147.

D. $\frac{11-12}{11-10}$. A. $\frac{3}{8}$. L. lat. 53. L. transv. 9/18.

Nape very gibbous; profile of the head abruptly descending. The greatest depth of the body is beneath the nape, where it is three times in the total length; the length of the head is $3\frac{2}{3}$ in the same. The præorbital is as long as high; its maxillary edge is emarginate, and the greater part of the maxillary bone cannot be hidden below the præorbital; limb of præoperculum scaly; a protuberance above the upper anterior angle of the eye. Molars small anteriorly, numerous, and irregularly arranged; two large ones on each side, behind the middle of each jaw. Dorsal spines moderate, of nearly equal strength; the third and fourth nearly equal in length; the second and third anal spines are 3½ in the length of the head. Red; the soft portions of the dorsal and anal fins black.

Cape of Good Hope.

a. 23″ long: stuffed. Cape Seas. Purchased of Mr. Argent.
b. 21″ long: stuffed. Cape Seas. Purchased of Sir A. Smith.
c. 21″ long: not good state: stuffed. Cape Seas. Purchased of Sir A. Smith.
d. 17″ long: skin. False Bay

8. Chrysophrys calamus.

Pagellus calamus, *Cuv. & Val.* vi. p. 206. pl. 152.
? Pagellus penna, *Cuv. & Val.* vi. p. 209; *Guichen. in Ramon de la Sagra, Hist. Cub. Poiss.* p. 82.

D. $\frac{12}{12}$. A. $\frac{3}{10\text{–}11}$. L. lat. 50–56. L. transv. 7/19 Vert. 22.

The height of the body is 2¾ in the total length, the length of the head 3¾. Forehead broad, with a protuberance before the upper angle of the orbit; the upper profile of the snout abruptly descending; the præorbital very large, higher than long; the upper maxillary with a prominent knob at its upper extremity (sometimes absent); the posterior opening of the nostrils a very long slit. Molars above in three series, beneath in two. Canines very distinct with age, and sometimes bent outward. Greenish, with golden longitudinal streaks; dorsal and anal spotted with blackish; ventral blackish.

Atlantic shores of Tropical America.

a. Adult. Bahia. Purchased of M. Parzudaki.
b. Half-grown. Trinidad. Presented by J. B. Richardson, Esq.
c. Fine specimen. Cuba. From the Collection of the Zoological Society.
d–h. Adult: skins. Jamaica. From Dr. Parnell's Collection.
i–m. Half-grown: skins. Jamaica. From Dr. Parnell's Collection.
n. Fifteen inches long: stuffed.
o. Adult: stuffed.
p. Half-grown: stuffed.

This species has very distinct canines when in mature age, and therefore it cannot remain in the genus *Pagellus*, to which it was referred by Valenciennes.

Pagellus microps, Guichen. *l. c.* p. 83. pl. 3. f. 1, appears to be different from the above species, although closely allied. It is said to have two series of molars in the upper jaw.

9. Chrysophrys sarba.

Russell, pl. 91.
Sparus sarba, *Forsk.* p. 31; *L. Gm.* p. 1275; *Bl. Schn.* p. 280; *Lacep.* iv. pp. 97, 103.
—— bufonites, *Lacép.* iv. pp. 141, 143. pl. 26. f. 3.
—— psittacus, *Lacép.* iv. pp. 141, 143.
Chrysophrys sarba, *Cuv. & Val.* vi. p. 102; *Rüpp. N. W. Fische.* p. 110 pl. 28. f. 1.
—— chrysargyra, *Cuv. & Val.* vi. p. 107.

D. $\frac{11}{12-13}$. A. $\frac{3}{11}$. L. lat. 55. L. transv. 7/14.

The height of the body is $2\frac{2}{3}$ in the total length, the length of the head four times; the distance between the eyes is rather more than their diameter, which is $1\frac{2}{3}$ in the length of the snout. The præorbital is $1\frac{1}{3}$ as long as high; a slight protuberance above the upper anterior angle of the eye. The incisors are broad, obtuse; the molars in great number, forming four series, above and beneath: a large ovate molar at the posterior end of each jaw. Dorsal spines moderate, rather compressed, broader on one side; the fourth is the longest; the second and third anal spines nearly equal, $2\frac{3}{4}$ in the length of the head. Silvery, with about fourteen indistinct longitudinal streaks in preserved specimens.

From the Red Sea to the Ile de France and to the Molucca Sea.

a. Adult: stuffed. Red Sea. From the Frankfort Museum.
b. 21″ long: stuffed. From the Collection of the Zoological Society.

10. Chrysophrys haffara.

Sparus haffara, *Forsk.* p. 33; *L. Gm.* p. 1276; *Bl. Schn.* p. 279.
Chrysophrys haffara, *Cuv. & Val.* vi. p. 108; *Rüpp. N. W. Fische,* p. 111. taf. 29. f. 1.

D. $\frac{11}{13}$. A. $\frac{3}{10-11}$. Cæc. pylor. 3.

The height of the body is one-third of the total length, the length of the head one-fourth. The upper profile of the head is parabolic, prominent above the nostrils, and truncated in front. Dorsal spines moderate, of equal strength; the second anal spine rather stronger, but scarcely longer than the third, $3\frac{1}{2}$ in the length of the head; the spinous portion of the dorsal fin higher than the soft. Uniform silvery.

Red Sea.

11. Chrysophrys bifasciata.

Valent. Amb. iii. p. 147; *Renard,* ii. 19, 91 (very bad).
Chætodon bifasciatus, *Forsk.* p. 64.
Holocentrus rabaji, *Lacép.* iv. p. 725.
Sparus mylio, *Lacép.* iv. p. 131, iii. pl. 26. f. 2.
Labrus catenula, *Lacép.* iii. p. 467. pl. 26. f. 3.
Chrysophrys bifasciata, *Cuv. & Val.* vi. p. 118; *Rüpp. N. W. Fische,* p. 112.

D. $\frac{11}{13}$. A. $\frac{3}{10-11}$. L. lat. 50. L. transv. 6/12.

The height of the body is nearly three times in the total length.

the length of the head $3\frac{2}{3}$; the diameter of the eye is $1\frac{1}{2}$ in the distance between the eyes, and $2\frac{1}{4}$ in the length of the snout. The præorbital is $1\frac{1}{2}$ as long as high; a slight protuberance above the upper anterior angle of the eye. The incisors are broad, obtuse; the molars in great number anteriorly, posteriorly larger, and forming three series. Dorsal spines rather strong and compressed, broader on one side; the fourth is slightly longer than the third and fifth; the second anal spine longer and stronger than the third, and $2\frac{3}{4}$ in the length of the head. Silvery, with two black cross-bands from the nape, one through the eye, the other along the posterior margin of the operculum.

Red Sea; East Indian Seas.

a. Adult: stuffed. Red Sea. From the Frankfort Museum.

12. **Chrysophrys aries.**

Temm. & Schleg. Faun. Japon. Poiss. p. 68. pl. 31; *Bleek. Verhand. Batav. Genootsch.* xxvi. p. 87.

D. $\frac{11}{13-14}$. A. $\frac{3}{11-12}$. L. lat. 58. L. transv. 8/14.

The height of the body is $2\frac{1}{2}$ in the total length, the length of the head $4\frac{1}{6}$; the diameter of the eye is equal to the distance between the eyes, and $1\frac{1}{2}$ in the length of the snout; forehead somewhat swollen and prominent. The præorbital is $1\frac{1}{4}$ as long as high. The incisors are rather broad, triangular, pointed; the molars form three series in the upper jaw and three in the lower, the middle containing several larger teeth. Dorsal spines moderate and somewhat compressed, a little broader on one side; the third, fourth, and fifth are longest; the second anal spine rather stronger, but not longer than the third, and $2\frac{1}{2}$ in the length of the head. Coloration uniform, with indistinct longitudinal streaks.

Chinese and Javanese Seas.

a. Adult. China.
b, *c* Half-grown. China.

13. **Chrysophrys taurina.**

Chrysophrys taurina, *Jenyns, Zool. Beagle, Fishes,* p. 56. pl. 12; *Valenc. Voy. Vénus,* v. p. 330.
—— cyanoptera, *Valenc. l. c. Poiss.* pl. 4. f. 2.

D. $\frac{12}{12}$. A. $\frac{3}{10}$. L. lat. 50.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head four times; the diameter of the eye is twice in the length of the snout. Præorbital elevated. There are four series of scales on the præoperculum and operculum. Above, three series of molar teeth, without a large oval one at the back; two series in the lower jaw. Dorsal spines moderate; anal spines rather stout, the second being a little stronger and longer than the third. White, with four dark-brown much-interrupted bands, giving a mottled appearance.

Chatham Island (Galapagos Archipelago)

14. Chrysophrys hasta.

Sparus hasta, *Bl. Schn.* p. 275.
Coius datnia, *Buch. Ham. Fish. Gang.* p. 88. pl. 9. f. 29.
Chrysophrys longispinis, *Cuv. & Val.* vi. p. 116; *Bleeker, Verhand. Batav. Genootsch.* xxv. *Nalez. Ichth. Faun. Beng. & Hind.* p. 93.
—— berda, *Cuv. & Val.* vi. p. 113; *Richardson, Ichth. China,* p. 240.
—— longispinis, *Faun. Japon. Poiss.* p. 68. pl. 32; *Richardson, Ichth. China,* p. 240.
—— schlegelii, *Bleeker, Japan,* p. 400, and *Verhand. Batav. Genootsch.* xxvi. p. 86.
—— calamara, *Cant. Catal.* p. 48 (not *C. & V.*).
—— xanthopoda, *Richardson, Ichth. China,* p. 241.
—— auripes, *Richardson, l. c.*

D. $\frac{11\text{–}12\ (13)}{11\text{–}10\ (\ 9)}$. A. $\frac{3}{8\text{–}9}$. L. lat. 42–45. L. transv. $\frac{4\text{–}5}{11}$.

The height of the body is $2\frac{2}{3}$ in the total length, the length of the head $3\frac{2}{3}$; the eye is relatively much larger in immature specimens, in which it equals the distance between the eyes, and is $1\frac{1}{4}$ in the length of the snout. In adult specimens the diameter of the eye is $1\frac{3}{4}$ in the width of the forehead and twice in the length of the snout. The præorbital is twice as long as high, and, especially in very large specimens, considerably notched, to receive the posterior extremity of the maxillary bone. There is a very slight protuberance above the upper anterior angle of the eye. The incisors are conical, pointed, of moderate strength; the molars in great number, above in four or even five series, beneath in three, sometimes in four. Dorsal spines strong, compressed, broader on one side; the fourth is the longest; the second anal spine very strong, $1\frac{1}{2}$ in the length of the head. Operculum with a rather prominent spine. Silvery; anal blackish, dorsal edged with blackish.

Bay of Bengal, entering the rivers; Chinese and Japanese Seas.

A. Western specimens with 11 dorsal spines: *Sparus hasta,* Bl. Schn., *Chrysophrys berda,* Valenc., but not *Sparus berda,* Forsk.

a. 15″ long: skin. Ceylon. Collected by E. F. Kelaart, M.D.
b. 17″ long: stuffed. From the Collection of the Zoological Society.
c. Adult: stuffed. Bay of Bengal. From Dr. Cantor's Collection as *Pagrus flavipinnis.*
d. Half-grown. Madras. Presented by J. C. Jerdon, Esq.
e. Adult: stuffed.
f. Half-grown. From the Collection of the Zoological Society.—The second ray of the anal fin is transformed into a spine.

B. Western specimens with 12 dorsal spines: *Coius datnia,* Buch. Ham., *Chr. longispinis,* Valenc., Bleek.

g. Fine specimen. Calcutta. Presented by G. R. Waterhouse, Esq.
h. Adult: stuffed. Ganges at Calcutta. Purchased of Mr. Warwick.
i. Adult: stuffed. Bay of Bengal. From Dr. Cantor's Collection as *Pagrus flavopinnis.*

C. Western specimen with 13 dorsal spines.

k. Adult: stuffed.

D. Eastern specimens with 11 dorsal spines: *Chr. longispinis*, Schleg., Richards., *Chr. xanthopoda*, Richards., *Chr. schlegelii*, Bleek.

l. Half-grown. China.
m. Half-grown. China. Presented by J. R. Reeves, Esq.
n, *o*. Adult: stuffed. China. Presented by J. R. Reeves, Esq.—Types of *Chr. xanthopoda* and *Chr. auripes*, Richardson.
p, *q*. Adult and half-grown: skins. China. Purchased of Mr. Warwick.
r. Adult: stuffed. Japan.
s. Adult. From the Haslar Collection?
t. Adult: stuffed. (Named *Chr. marginata*?)
u. ? Adult: bad state. N.W. Australia. Presented by Sir J. Richardson.

The fine series of specimens in the Collection of the British Museum has enabled me not only to rectify the synonymy, but to form also a judgment on the differences observed in fishes from different localities. Above all, there are three fishes described by older authors: *Sparus berda* by Forskål, from the Red Sea, *Sp. hasta* by Schneider, from the coast of Coromandel, and *Coius datnia* by Buchanan Hamilton, from the Bay of Bengal. The description of the first would appear too insufficient to admit of a decision but for the figure given by Rüppell, which undoubtedly represents the same fish. We shall afterwards see that it is highly probable that the Red Sea fish must be separated from those of the East Indies, and that Valenciennes is wrong in applying the name of *Sp. berda* to the latter. Not having had specimens from the Red Sea, or the figure published by Rüppell, Valenciennes was unable to compare both species. Thus the second name, *Sp. hasta*, given by Schneider, has the right of priority. Schneider had a specimen with eleven dorsal spines, and he gives a good diagnosis, by which the fish may be easily recognized; and his specimen coming from the coast of Coromandel, cannot be identified with Forskål's fish. With regard to *Coius datnia*, Buch. Ham., I have shown above (p. 283) that Cuvier was entirely wrong when he confounded it with *Datnia argentea* (*Therapon argenteus*, m.); the description given by Buchanan Hamilton is quite correct, and there cannot be the least doubt, from the dentition stated, that this ichthyologist described a Sparoid fish. The figure is excellent, and agrees with the specimen (*g*.) of the British Museum Collection as if it were drawn from it.

In the sixth volume of the 'Histoire Naturelle des Poissons,' Valenciennes confounds, under the name of *Chr. berda*, Bengal specimens of *Sparus hasta* with eleven dorsal spines, and *Sp. berda*, Forsk. Under the name of *Chr. longispinis*, he unites specimens from Japan and those from Bengal with twelve dorsal spines.

Schlegel and Rüppell have not compared their specimens with examples from other localities: the former applies Valenciennes's name of *Chr. longispinis* to those from Japan · the latter correctly restores Forskål's name to the Red Sea fish (the following species), and gives an excellent figure.

Sir J. Richardson, in his Report on the Ichthyology of the Seas of China and Japan, has, in my opinion, entirely mistaken these fishes in the British Museum Collection, the Chinese and Japanese specimens of which only he has examined. He refers those preserved in spirits (sp. *l*, *m*.) to *Chr. berda*; another (sp. *r*.), deformed by stuffing, and probably purchased in Holland, to *Chr. longispinis*; finally, two other stuffed specimens (*n*, *o*), presented by Mr. Reeves, and differing little from each other, which better retained their natural form, were considered by him as types of two new species—*Chr. auripes* and *xanthopoda* (? *xanthopus*).

Bleeker made no reference to *Chr. berda*, Valenc., probably because he thought it identical with the fish described by Forskål and Rüppell, and endeavoured to show a specific difference between the Bengal specimens and those from the Japanese Seas,—taking for the former the name of *Chr. longispinis*, and for the latter a new denomination, *Chr. schlegelii*. All the Bengal specimens of his Collection exhibited twelve dorsal spines, and examples with eleven were unknown to him.

After having thus illustrated the synonymy of this and the following species, I shall make some remarks on the differences found in the specimens from different localities, and first compare the Red Sea fish with those from the East Indies. Although not having a specimen from the Red Sea, the figure given by Rüppell appears to be quite correct, like all contained in his admirable works on the fishes of the Red Sea, and fully sufficient for the purpose. From that figure it may be seen that the Red Sea fish has a much higher body even than those from Bengal, which are said to be higher than those from Japan; secondly, it has the second anal spine much shorter than any of the East Indian or Japanese specimens; thirdly, there is a very conspicuous opercular spine in all the specimens from the East Indies, Japan, and China, but nothing of it is mentioned in the Red Sea fish or marked in the figure,—a character which certainly would not have been overlooked by so accurate an observer as Dr. Rüppell. From these differences I am induced to believe that *Sparus berda*, Forskål, forms a really separate species.

In the East Indian specimens the following differences were observed:—

1. Bleeker states the Bengal fish to be higher than that from Japan; I found, in specimens of the same size, the height of the body, absolutely, and compared with the total length, exactly the same. There are, moreover, Bengal specimens in the British Museum Collection with a body not so deep as may be observed in examples from China. There is some variation in this respect in all the species of fishes, according to their sex, or to the season in which they are caught. At all events, the difference appears to be less than between the Red Sea fish and the species from the East Indies.

2. Bleeker states eleven dorsal spines for the Japanese fish, and

twelve for the Bengalese. It is evident from my examination that the number varies in the latter. It must be considered a rule *in those fishes with a truly single dorsal fin, composed of a spinous and soft portion, that often one or two soft rays, nearest to the spines, are transformed into true spines,* the number of the latter thus appearing to be increased. That is the case in this species, where we find specimens with eleven spines and eleven rays, or others with twelve spines and then with ten rays only. This view is very nicely illustrated by a specimen of this (and of other) species in the British Museum Collection, where the second ray of the anal fin is transformed into a true spine. A variation of the spines, corresponding to that of the rays, is much less observed in those Acanthopterygii which have the dorsal divided by a more or less deep notch.

3. Valenciennes says that his *Chr. longispinis* from Japan and Bengal has a somewhat longer second anal spine than the other (*Chr. berda*, Val., from Pondicherry), and Bleeker states nearly the contrary, viz. that the Bengal fish has that spine longer than the Japanese one. There is variation also in this respect: immature and half-grown specimens have that spine generally relatively longer; but we find specimens of the same size, from Japan and Bengal, where this spine is equal.

4. I could not observe a conspicuous difference in the height of the dorsal fin, as stated by Bleeker.

5. The examination of any of the Sparoids in different ages shows that the molar teeth are subjected not only to a regular reproduction, like the front teeth, but also to a different arrangement. Therefore the number of the series of molars and their shape can be used as a specific character only when founded on the examination of several specimens. If there are several series of molars, the inner series generally contains the smallest ones and extends more or less backwards, so that sometimes a specimen appears to have one series more than another. This is the case in the two fishes on which Sir J. Richardson has founded *Chr. auripes* and *xanthopoda*, the latter of which had lost moreover one of the canines. Both the specimens are stuffed skins, one-half of which only is preserved.

15. Chrysophrys calamara.

Calamara, *Russell*, i. pl. 92.
Chrysophrys calamara, *Cuv. & Val.* vi. p. 117; *Bleeker, Verhand. Batav. Genootsch.* xxiii. *Spar.* p. 10.
—— berda, *Bleek. Topogr. Batav.* and *Ichth. Madura.*

D. $\frac{11}{11}$. A. $\frac{3}{9}$. L. lat. 35.

The height of the body is $2\frac{2}{3}$–$2\frac{3}{4}$ in the total length, the length of the head about four times; the diameter of the eye is one-fourth of the latter and equal to the length of the snout. The molars in four or five series, the largest ones in the outer series. The præorbital is much lower than the orbit. There are five series of scales between the præorbital and the angle of the præoperculum. Dorsal spines strong; the fourth is the longest, one-third of the length of the head; pectoral fins longer than the head, and reaching to the origin of the anal; ventral fins shorter than the head, with the spine as long as one-third the height of the body; the second anal spine very strong, $2\frac{1}{5}$–$2\frac{1}{2}$ in the length of the head; caudal emarginate, with the lobes obtuse. Silvery-greyish, with twelve darker longitudinal streaks; the vertical fins black-edged. (*Bl.*)

Indian Archipelago.

16. **Chrysophrys berda.**

Sparus berda, *Forsk.* p. 32; *Lacep.* iv. pp. 31, 105.
Chrysophrys berda, *Rüpp. N. W. Fische,* p. 120. taf. 27. f. 4 (not *Cuv. & Val.*).

D. $\frac{11}{11-12}$. A. $\frac{3}{10}$.

The height of the body is $2\frac{1}{4}$ in the total length, the length of the head $3\frac{2}{3}$. The præorbital is twice as long as high, and notched to receive the posterior extremity of the maxillary bone. Dorsal spines strong, compressed, broader on one side; the fourth is the longest, one-half the length of the head, and equal in length to the second anal spine. (Operculum without spine?) Coloration uniform. (*Rüpp.*)

Red Sea.

17. **Chrysophrys australis.** (Plate XXVIII. fig. B.)

D. $\frac{11}{10-11}$. A. $\frac{3}{8}$. L. lat. 44–45. L. transv. 5/13.

The height of the body is nearly one-third of the total length, the length of the head one-fourth. The diameter of the eye is $4\frac{2}{3}$ in the latter, and $1\frac{1}{2}$ in the length of the snout. The molars in four series in the upper jaw and in three in the lower; the posterior ones are the largest. The præorbital is rather lower than the orbit. There are five series of scales between the præorbital and the angle of the præoperculum. Dorsal spines strong; the fourth is the longest, and nearly one-half of the length of the head. The second anal spine very strong, equal in length to the fourth of the dorsal. Silvery, with shining golden longitudinal streaks; edge of the spinous dorsal and axil black.

Australian Seas, entering rivers.

a. Sixteen inches long: stuffed.
b. Adult. From the Haslar Collection.
c. Adult: skin. Port Essington. Voyage of H.M.S. Fly.
d. Adult: skin. Port Jackson. Purchased of J. Gould, Esq.
e, f. Adult and half-grown: skins. Australia. Purchased of Mr. Warwick.
g, h. Adult: skins. Harvey River. (Fresh water, West Australia.)

Description.—This species belongs to the group with the body elevated and the anal spines strong, which is formed by *Chr. berda*. *hasta*, and *calamara*, all being East Indian species. The body is very compressed, and its greatest height is nearly one-third of the total. The head is relatively rather small, its length being one-fourth of the total; its width between the eyes is 3½ in its length. The profile of the nape is strongly curved, and descends abruptly like that of the head, which has a slight protuberance between the eyes. The distance from the occiput to the dorsal fin is much longer than to the snout. The snout is moderately elevated, equal to 1½ diameter of the eye; the upper maxillary, which is nearly entirely hidden by the præorbital, reaches to the vertical from the anterior margin of the orbit. The præorbital has the maxillary edge slightly emarginate, and is 1½ as long as high. The nostrils are placed before the upper angle of the orbit and remote from each other; the posterior is an elongate slit, the anterior a very small ovate opening. There are five series of scales between the præorbital and the angle of the præoperculum; the inferior limb and the angle are naked. Operculum, sub- and interoperculum covered with scales; the former has the posterior point not prominent. The suprascapula is striated, like the series of scales ascending to the nape of the neck.

The origin of the *dorsal* fin falls vertically above the root of the pectorals, and its end above the 34th scale of the lateral line. The spines are strong, compressed, and much broader on one side: the first is two-fifths of the second; the fourth is the longest, nearly one-half of the length of the head; the following gradually decrease, the last being about two-thirds of the fourth. The soft portion of the fin is rather lower than the spinous, and has the posterior extremity rounded; the fifth and sixth rays are longest, and about three-quarters of the longest spine. The distance between the dorsal and caudal fins is rather less than the depth of the tail beneath the extremity of the dorsal fin. The *caudal* fin is emarginate, with pointed lobes; one of the middle rays is one-half of one of the outer ones. The origin of the *anal* fin falls vertically below the fifth dorsal ray, and its end a little behind that of the dorsal fin. The first spine is very short; the second is equal to the fourth dorsal spine, though stronger; the third is more feeble and shorter. The anterior rays equal the third spine, and the posterior ones gradually become shorter. The *pectoral* fin is elongate, and reaches to the origin of the soft anal, the fourth ray exceeding the others in length. The *ventrals* are much shorter; they are inserted behind the pectorals, and do not extend to the vent; the spine is compressed and rather strong, about three-quarters of the adjacent ray.

The *scales* are minutely ciliated, higher than long, nearly elliptical but for the posterior margin, which is straight; one of the largest covers four-fifths of the eye.

There are six canine-like *teeth* in each of the jaws, with a villiform band behind them. The outer series of the lateral ones is formed by rather conical teeth. There are four series in the upper jaw, the posterior teeth gradually becoming larger; the posterior tooth of the third series is the largest of all. There are three series only in the lower jaw, which have the largest teeth also posteriorly; but there are several other small ones at the hindmost extremity of the jaw.

The teeth of the upper pharyngeal bones are exceedingly fine, villiform; those of the lower ones setiform, with an outer series of larger ones, hook-like.

The coloration is now uniform silvery, with golden longitudinal streaks; the dorsal fin is blackish, with a black edge on the spinous portion. The caudal fin has a broad blackish margin; anal and ventrals blackish; axil black.

	inches.	lines.
Total length	9	3
Length of the head	2	4
Height of the body	3	3
Diameter of the eye	0	6
Distance between the eyes	0	8
Length of the fourth dorsal spine	1	1
——— of the eleventh dorsal spine	0	9
——— of the fifth dorsal ray	0	10
——— of the second anal spine	1	1
——— of the third anal spine	0	10½
——— of the pectoral	2	7
——— of the ventral	1	7
——— of the ventral spine	1	2
——— of a scale	0	4⅕
Height of a scale	0	5½

18. Chrysophrys aculeata.

? Aurata bahamensis, *Catesby, Hist. Carol.* p. & pl. 16.
? Sparus chrysops, *L. Gm.* p. 1277; *Bl. Schn.* p. 277.
Chrysophrys aculeata, *Cuv. & Val.* vi. p. 137.

D. $\frac{12}{12}$. A. $\frac{3}{12}$. Vert. 10/14.

Body rather elongate. A recumbent spine before the dorsal. Molar teeth small, in three series in the upper jaw. Limb of the præoperculum scaly. Pectoral elongate. Silvery, reddish on the sides, with golden longitudinal streaks; dorsal and anal fins reddish brown; ventrals red. (*Val.*)

Atlantic Coasts of the United States.

This fish may prove to be a species of *Sargus*, having a recumbent dorsal spine, like the other North American *Sargi*. It appears to be very near to *Sargus ambassis*, from which, however, it must be different (if the description of Valenciennes is correct), having the body much more elongate, and the upper molars arranged in three series.

Fifth Group. PIMELEPTERINA,

Sparidæ with cutting teeth in front, and with teeth on the palate. One genus only.

21. PIMELEPTERUS*.

Pimelepterus, (*Lacép.*) *Cuv. Règne Anim.*; *Cuv. & Val.* vii. p. 254.
Kyphosus, (*Lacép.*) *Cuv. Règne Anim.*

In both jaws a single anterior series of cutting teeth, implanted by a horizontal posterior process, behind which is a band of villiform teeth; fine teeth on the vomer, the palatine bones, and on the tongue. The soft portions of the vertical fins thickly enveloped by minute scales; eleven dorsal and three anal spines. Præoperculum generally denticulated. Scales of moderate size, bony. Seven branchiostegals. Pyloric appendages sometimes in small number, sometimes exceedingly numerous. Air-bladder notched posteriorly and sometimes anteriorly.

Apparently in all the tropical seas.

1. Pimelepterus boscii.

Pimelepterus boscii, *Lacép.* iv. pp. 429, 430; *Cuv. & Val.* vii. p. 258. pl. 187, cop. by *Dekay, New York Fauna, Fishes*, p. 100. pl. 20. f. 56; *Valenc. in Webb & Berth. Hist. Nat. Iles Canar. Poiss.* pl. 19.
Pimelepterus incisor, *Valenc. l. c.* p. 47 (not *Cuvier*).
? Pimelepterus oblongior, *Cuv. & Val.* vii. p. 264.

D. $\frac{11}{12}$. A. $\frac{3}{11}$. L. lat. 66. L. transv. 10/20. Vert. 9/16.

The height of the body is three times in the total length, the length of the head 4¼; the distance between the eyes is 2½ in the length of the head. The longest dorsal spine is about one-fifth of the height of the body, rather longer than the soft portion of the dorsal, and nearly equal to the longest anal ray. The horizontal process of the teeth not much longer than the vertical. Uniform brownish (in a preserved state); a silvery streak along the præorbital.

Tropical parts of the Atlantic; Sea of Madeira.

a. Adult: skin. Jamaica. From Dr. Parnell's Collection.
b. Adult: stuffed. Cuba. From Dr. Poey's Collection.
c. Half-grown: stuffed. Madeira. From the Rev. R. T. Lowe's Collection.

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* 1. Pimelepterus dussumieri, *Cuv. & Val.* vii. p. 273; *Cuv. Règne Anim. Ill. Poiss.* pl. 43. f. 1.—Bay of Bengal.
2. Pimelepterus raynaldi, *Cuv. & Val.* vii. p. 274.—Sunda Sea.
3. Pimelepterus oblongior, *Cant. Catal.* p. 174.—Pinang.
4. Pimelepterus incisor, *Cuv. & Val.* vii. p. 266 (not *Valenc. in Webb & Berth.*).—Brazil.
5. Pimelepterus indicus, *Cuv. & Val.* vii. p. 270; *Faun. Japon. Poiss.* p. 86.—Japanese Sea.
6. Pimelepterus lævifrons, *Tschudi, Faun. Peruan. Ichthyol.* p. 18.—Lima.

2. Pimelepterus fuscus.

Xyster fuscus, (*Commers.*) *Lacép.* v. pp. 484, 485.
Pimelepterus fuscus, *Cuv. & Val.* vii. p. 264; *Rüpp. N. W. Fische*, p. 34. taf. 10. f. 3.

D. $\frac{11}{12}$. A. $\frac{3}{11}$. L. lat. 68. L. transv. 12/22. Cæc. pylor. ca. 1000. Vert. 9/16.

The height of the body is one-third of the total length; the distance between the eyes is $2\frac{1}{3}$ in the length of the head. The soft portions of the dorsal and anal fins lower than the longest dorsal spine. The horizontal portion of the incisors three times as long as the vertical. Uniform greyish.

Cape of Good Hope; Red Sea.

a. 21 inches long: stuffed. Red Sea. From Dr. Rüppell's Collection.
b. 25 inches long: stuffed.
c. 21 inches long: stuffed.
d. Young. Old Collection, as *Chætodon cyprinoides*.

3. Pimelepterus waigiensis.

Pimelepterus waigiensis, *Quoy & Gaim. Voy. Freyc. Zool.* p. 386. pl. 62. f. 4.
Pimelepterus marciac, *Cuv. & Val.* vii. p. 267; *Rüpp. N. W. Fische*, p. 35.

D. $\frac{10-11}{15-14}$. A. $\frac{3}{13}$. L. lat. 75. L. transv. 12/20. Cæc. pylor. 5–6.

The height of the body is $2\frac{2}{3}$ to $2\frac{3}{4}$ in the total length. The breadth between the eyes is $2\frac{2}{5}$ in the length of the head. The spinous dorsal fin is rather higher than the soft portion and the anal. The horizontal part of the incisors is distinctly longer than the vertical. Greyish; a silvery streak along the præorbital.

Coasts of New Guinea, Java, and Amboyna.

a. Adult. Old Collection, as *Chætodon cyprinoides*.
b. Half-grown. Purchased of Mr. Frank.
c. Half-grown. Amboyna. Purchased of Mr. Frank.
d. Half-grown: stuffed. From the Collection of the Zoological Society.
e. Young. India.

4. Pimelepterus lembus.

Cuv. & Val. vii. p. 269; *Bleek. Batav.* p. 469.

D. $\frac{11}{14}$. A. $\frac{3}{13}$. L. lat. 60. L. transv. 10/18.

The height of the body is $3\frac{1}{3}$ in the total length; the space between the eyes is $2\frac{2}{3}$ in the length of the head; the horizontal portion of the incisors is twice the length of the vertical. The spinous portion of the dorsal fin higher than the soft. Bluish, with brown longitudinal streaks; a golden band from the muzzle through the eye to the operculum; another from the maxillary to the præoperculum.

Seas of Batavia and Vanicolo.

a. Adult: not good state. Moluccas. Purchased of Mr. Frank.

5. Pimelepterus ternatensis.

Bleeker, Ternate, ii. p. 604.

D. $\frac{11}{14}$. A. $\frac{3}{13}$. L. lat. 60.

The height of the body is one-third of the total length. The spinous portion of the dorsal rather lower than the soft. Greenish, with brownish longitudinal streaks.

Sea of Ternate.

6. Pimelepterus tahmel.

Sciæna tahmel, *Forsk.* p. 53.
Pimelepterus altipinnis, *Cuv. & Val.* vii. p. 270; *Bleek. Banka,* ii. p. 727.
Pimelepterus tahmel, *Rüpp. N. W. Fische,* p. 35. taf. 10. f. 4.

D. $\frac{11}{12}$. A. $\frac{3}{11}$. L. lat. 60. L. transv. 9/21.

The height of the body is $2\frac{3}{4}$ in the total length; the distance between the eyes is $2\frac{2}{3}$ in the length of the head; the soft portions of the dorsal and anal fins elevated, much higher than the spinous. Greyish, with numerous reddish-brown longitudinal stripes. [Pyloric appendages in very great number.]

From the Red Sea through the Indian Ocean and Archipelago to New Guinea.

a. Adult: stuffed. Red Sea. From Dr. Rüppell's Collection.
b. Fine specimen. Philippine Islands.
c. Young. Amboyna. Purchased of Mr. Frank.
d. Young.

I here subjoin, as an appendix to this family, the description of a fish which I had no opportunity of examining, and which appears to be nearer the family *Pristipomatidæ,* from which, however, it differs by its peculiar dentition.

22. BORIDIA.

Boridia, *Cuv. & Val.* v. p. 154.

Two dorsal fins, the first with eleven spines. In each jaw three or four series of molar-like teeth; the anterior teeth also molar-like; no teeth on the palate. Cheeks scaly, fins scaleless. Scales of moderate size, not ciliated. Præoperculum denticulated.

Brazil.

1. Boridia grossidens.

Cuv. & Val. v. p. 154. pl. 114.

D. $11 \left| \frac{1}{13} \right.$. A. $\frac{3}{11}$.

Body rather elongate. Caudal forked; spines of the fins of moderate strength and length.

Brazil.

ADDENDA

Page 3. **Gasterosteus aculeatus**

appears to be found in Iceland.—Cfr. *Faber, Fische Islands*, p. 129

Page 4. **Gasterosteus argyropomus.**

The amended diagnosis is—

$$\text{D. } 1 \mid 1 \,\Big|\, \tfrac{1}{12}. \quad \text{A. } \tfrac{1}{10}. \quad \text{P. } 9. \quad \text{Vert. } 1/1.$$

Body without any plates. Dorsal spines short, serrated. Insertion of the ventrals rather nearer the first dorsal spine than the second; their extremities reach to the tip of the ventral plate. The posterior margin of the caudal fin truncated.

Page 4. 2 *a*. **Gasterosteus williamsoni.**

Girard, U. S. Pacif. R. R. Exped. Fishes, p. 93, and *Proc. Ac. Nat. Sc. Philad.* 1854, p. 133.

$$\text{D. } 1 \mid 1 \,\Big|\, \tfrac{1}{11}. \quad \text{A. } 1/7.$$

Body without any plates. Dorsal spines exiguous and slender, not serrated. Insertion of the ventrals slightly in advance of the second dorsal spine, their extremities not reaching the tip of the ventral plate. The posterior margin of the caudal fin subcrescentic. (*Gir.*)
Williamson's Pass (California).

Page 8. Add to the *Synopsis of the Genera*:—

Two dorsals. Neither præopercular nor ventral spine .... 4 *a*. HETEROPHTHALMUS.
Two dorsals. Præopercular spine none; one ventral spine.......................... 7. MYRIPRISTIS.

Page 12. Add another genus of **BERYCIDÆ**:—

4 *a*. **HETEROPHTHALMUS.**

Heterophthalmus, *Bleeker, Act. Soc. Sc. Indo-Nederl.* i. *Manado en Makass.* p. 42.

Muzzle very short, truncated, with the jaws nearly equal. Eye very large. Villiform teeth in the jaws and on the palatine bones, none on the vomer. Eight branchiostegals. Opercular bones serrated; præoperculum without spine. Scales small, ctenoid. Two separate dorsals; ventrals six-rayed, without spine; caudal forked; anal with two spines. Abdomen serrated.

Sea of Manado.

1. **Heterophthalmus katoptron.**

Bleek. l. c. p. 43.

D. 5 | $\frac{1}{14}$. A. $\frac{2}{12}$. V. 6. L. lat. 60.

Eye with a double lobe beneath the pupil. (*Bl.*)

Sea of Manado.

Page 51. Add t the *Synopsis of the Genera*:—

* *Lateral line none.* Pseudobranchiæ none; two dorsals. 54*a*. LEMBUS.

Page 62. **Paralabrax nebulifer.**

Figured by *Girard in U. S. Pacif. R. R. Exp. Fishes*, p. 33. pl. 12. f. 1–4.

Page 63. **Paralabrax clathratus.**

Figured by *Girard in U. S. Pacif. R. R. Exp. Fishes*, p. 34. pl. 12. f. 5–8.

Page 67. **Labrax multilineatus.**

Syn.: Labrax chrysops, *Girard in U. S. Pacif. R. R. Exp. Fishes*, p. 29. pl. 11. f. 1–4.

Page 74. Add as a doubtful species to **LUCIOPERCA**:—

1. Stizostedion boreus, *Girard in U. S. Pacif. R. R. Fishes*, p. 31. pl. 11. f. 5–8.—Northern rivers of North America.

Page 77. **BOLEOSOMA.**

Fishes closely allied to this and the preceding genus are described by Girard under the name of *Arlina effulgens*, Proc. Acad. Nat. Sc. Philad. 1859, p. 64,—of *Estrella atromaculata*, l. c. p. 65,—of *Oligocephalus** *lepidus*, *humeralis*, and *linsleyi*, l. c. p. 67,—of *Alvordius maculatus* and of *Catonotus fasciatus*, p. 68.

Page 88. **ANTHIAS.**

Add as uncertain species:—

1. Anthias lepidolepis, *Bleek. Act. Soc. Sc. Indo-Nederl.* ii. p. 37.—Amboyna.
2. —— hechtii, *Bleek. l. c.* p. 38.—Amboyna.
3. Centropristis macrophthalmus, *Müll. & Trosch. in Schomb. Hist. Barbad.* p. 666.—Caribbean Sea.

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* The praiseworthy attempt to form a generic name according to the rules of scientific naturalists has not been attended with success, the name *Oligocephalus* denoting a fish with a few heads,—and not with a small head, which Mr. Girard intended to signify.

Page 89. **Anthias borbonius.**

Syn.: Serranus delissii, *Benn. Proc. Comm. Zool. Soc.* i. p. 126.

Page 89. 2*a*. **Anthias manadensis.**

Bleeker, Act. Soc. Sc. Indo-Nederl. i. *Manado en Makass.* p. 39.

D. $\frac{10}{17}$. A. $\frac{3}{7}$. L. lat. 45.

The third dorsal spine a little longer than those which follow; ventrals not elongate; the caudal lobes very pointed and produced. Red: each dorsal scale shining golden, with an olive basal spot; body with two, head with three rose-coloured bands; the soft dorsal dotted with yellow. (*Bl.*)

Sea of Manado.

Page 89. 2*b*. **Anthias pleurotænia.**

Bleeker, Act. Soc. Sc. Indo-Nederl. ii. *Amboina*, p. 34.

D. $\frac{10}{17}$. A. $\frac{3}{7}$. L. lat. 52.

The third dorsal spine, the second ray of the ventral, and the caudal fin elongate. The denticulations at the angle of the præoperculum stronger. Rose-coloured, with two pearl-coloured bands along the lower half of the sides of the body. (*Bl.*)

Sea of Amboyna.

Page 89. 2*c*. **Anthias cheirospilos.**

Bleeker, l. c. p. 36.

D. $\frac{10}{17}$. A. $\frac{3}{7}$. L. lat. 40.

The third dorsal spine very long, filiform, the ventral and caudal fins elongate. The denticulations at the angle of the præoperculum stronger. Rose-coloured: the soft dorsal black at the top; anal and caudal fins violet posteriorly; pectorals with a violet blotch; ventrals violet, with rose-coloured longitudinal bands. (*Bl.*)

Sea of Amboyna.

Page 91. **Anthias macrophthalmus.**

I have lately ascertained that both the specimens from which the diagnosis was taken are from the Mauritius, and should be referred to *Serranus filamentosus*, Val., from which I do not know how to distinguish the *Centropristis macrophthalmus* of Müller and Troschel. The latter therefore forms, for the present, an uncertain species of *Anthias*, whilst it is replaced by

8. **Anthias filamentosus.**

Serranus filamentosus, *Cuv. & Val.* vi. p. 500.
Centropristis filamentosus, *Müll. & Trosch. in Schomb. Hist. Barb.* p. 666.
Serranus mitis, *Benn. Proc. Comm. Zool. Soc.* i. p. 127.

Diagnosis as given of *Centropristis macrophthalmus* (p. 91).

a. Large specimen: stuffed. Ile de France. From Dr. Janvier's Collection.

b. Fine specimen. Mauritius. From the Collection of the Zoological Society.—Type of *Serranus mitis*.

8*a*. **Anthias zonatus.**

Serranus zonatus, *Cuv. & Val.* vi. p. 509.
? Serranus argyrogrammicus, *Cuv. & Val.* viii. p. 472.
Serranus telfairii, *Benn. Proc. Comm. Zool. Soc.* i. p. 127.

This species is described as *Serranus zonatus*, p. 103, but it evidently belongs to *Anthias*.

Page 95. **Anthias cichlops.**

In a separate copy of Bleeker's paper "Diagnostische Beschryvingen van nieuwe Vischsoorten van Sumatra," published in *Natuurk. Tydschr. Nederl. Indie*, iv. 1853, the number of the dorsal spines is wrongly stated to be five, which is evidently a misprint. The proper reference to this species is—*Natuurk. Tydschr. Nederl. Ind.* iv. 1853, p. 245; and the number of the dorsal fin $\frac{10}{16}$.

Page 99. Add to the uncertain species in *Note* §:—

5. Serranus diktiophorus, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Manado en Makass.* p. 38.

Page 103. **Serranus filamentosus** and **zonatus**

are to be referred to *Anthias*.

Page 107. 15*a*. **Serranus amblycephalus.**

Bleeker, Act. Soc. Sc. Indo-Nederl. ii. *Amboina*, p. 32.

D $\frac{11}{16}$. A. $\frac{3}{8}$. L. lat. 120.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $3\frac{1}{6}$; the diameter of the eye is $4\frac{1}{2}$ in the latter. Snout entirely scaly. Spiniform denticulations at the angle of the præoperculum; sub- and interoperculum entire. The third, fourth and fifth dorsal spines longest, and as high as the soft portion. Yellowish-brown, with seven brownish-violet cross-bands: the first between the eyes, and trifid below the eye; the second across the neck; the fifth above the anal spines; all the bands with black spots along the margins. (*Bl.*)

Sea of Amboyna.

Page 141. **Serranus hexagonatus.**

Syn.: Serranus stellans, *Bleeker, Act. Soc. Sc. Indo-Nederl.* i. *Amboina*, p. 29.

Page 154. 127*a*. **Serranus melanotænia.**

Bleeker, Act. Soc. Sc. Indo-Nederl. ii. p. 33.

D. $\frac{9}{14}$. A. $\frac{3}{8}$. L. lat. 110.

The height of the body is one-fourth of the total length. Rose-coloured, with a broad black band from the eye to the end of the dorsal; body and vertical fins dotted with white, the dots on the snout, back, and dorsal fin edged with violet; a large round black spot above, on the base of the caudal. (*Bl.*)

Sea of Amboyna.

Page 161.

The name of *Plectropoma cyanostigma* is to be altered into that of *Plectropoma ocellatum*, the former having been given by Bleeker to a fish which is identical with *Plectropoma leopardinum* (p. 157).

Page 169. **Pogonoperca ocellata.**

Access to the *Acta Soc. Scient. Indo-Nederl.* was only to be obtained after the printing of the family of Percidæ was nearly finished. It is now evident, from the excellent description by Dr. Bleeker contained in the 2nd volume, p. 31, that the above fish is identical with *Grammistes punctatus*, Cuv. & Val., mentioned in this Catalogue, p. 171. A generic separation from *Grammistes*, however, appears to be fully justified, and the proper denomination therefore will be *Pogonoperca punctata*. The species not being new, I have not considered it necessary to give the figure.

From Amboyna.

Page 178. **Genyoroge bengalensis.**

The formula of the fins has been omitted:—

D. $\frac{11}{14}$. A. $\frac{3}{8}$. L. lat. 65.

Page 179. **Genyoroge cæruleovittata.**

Syn.: Diacope angulus, *Benn. Proc. Comm. Zool. Soc.* i. p. 127.

Page 179. 5*a*. **Genyoroge spilura.**

Diacope spilura, *Benn. Proc. Comm. Zool. Soc.* 1832, p. 182.

D. $\frac{11}{12}$. A. $\frac{3}{8}$.

On each side five broad, parallel, red longitudinal bands; a large black blotch before the base of the caudal fin; the spinous part of the dorsal with a narrow blackish margin superiorly and inferiorly. (*Benn.*)

Sea of Ceylon.

Page 222. AMBASSIS.

Add to the diagnosis: Scales deciduous, generally large; in some species very small.

Page 255. Add a new genus of PERCIDÆ:—

54 *a*. LEMBUS*.

Lateral line none. Branchiostegals six; pseudobranchiæ absent. Body subfusiform; cleft of the mouth rather wide, with the lower jaw longest. A band of villiform teeth in the jaws and on the vomer; no canines or palatine teeth. Opercles neither serrated nor armed. Two dorsals, the first with seven slender spines; anal spines indistinct. Scales rather small, ctenoid. Air-bladder present.

Fresh waters of Ecuador.

1. Lembus maculatus.

B. 6. D. $7 \mid \frac{1}{9}$. A. $\frac{2}{9}$. L. lat. 57. L. transv. 22.

Yellowish, irregularly spotted with blackish: back with five dark cross-bars; a black blotch behind the extremity of the operculum; three blackish streaks radiating from the eye; the vertical fins dotted with blackish.

a. Andes of Ecuador. From Mr. Fraser's Collection.

Description.—This fish is one of the most interesting additions in the collections sent home by Mr. Fraser. It is a true representative, in South America, of the Perches of the Arctic regions. It offers, however, several modifications of the typical characters, the most important of which appears to be the absence of the lateral line. In general appearance it resembles *Lucioperca*, or some of the other elongate Perches, its greatest height below the spinous dorsal being one-fifth of the total length (without caudal†). The body is rather thick, its greatest thickness between the opercles being five-sixths of the height. The tail is compressed. The length of the head is one-third of the total; it is rather depressed, broad and flat superiorly, the width between the orbits being $4\frac{1}{2}$ in the length of the head, or $1\frac{2}{3}$ the diameter of the eye. The snout is produced, depressed, with the lower jaw longest, and with the cleft of the mouth wide, the upper maxillary reaching nearly to below the middle of the eye. There are two nostrils on each side, far apart from each other: the posterior is near the upper angle of the orbit; the anterior is minute, and close to the upper extremity of the maxillary bone. The eye is of moderate size, one-seventh the length of the head, situated high up the sides, so that its margin interferes with the upper profile of the head. The præoperculum has the posterior margin subvertical, the angle and the lower margin rounded; it is longer than high, and has no serrature whatever. The operculum and suboperculum are slightly produced posteriorly into a flexible point. The branchiostegous membrane is fixed to the isthmus, without touching that of the other side. The head is entirely covered with small scales, except the snout.

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* From λέμβος, a small, long, swift boat.

† The caudal fin is lost in the single specimen, which is otherwise very well preserved.

The spinous *dorsal* commences at some distance from the vertical from the base of the pectorals, and is composed of seven slender flexible spines, entirely separated from the soft dorsal; the first spine is rather shorter than the second, the length of which is one-half that of the head; the following become gradually shorter. The second dorsal commences nearer to the root of the caudal than to the occiput; it is subquadrangular and rather elevated; the first ray is the shortest, undivided, and may be considered as a spine; the following rays gradually become longer to the last two, which are considerably higher than the spinous dorsal. The commencement and the end of the *anal* fin fall vertically behind those of the soft dorsal, which it resembles in form; the first two rays are undivided; the sixth branched ray is the longest, higher than the spinous, and lower than the soft dorsal. The *pectoral* is rounded, and composed of slender branched rays; it does not extend on to the vent. The *ventral* is inserted exactly below the pectoral, and composed of one feeble spine and five rays, the fourth of which is the longest, nearly reaching to the vent.

The *scales* are rather small, ctenoid, pentangular, with the basal margin vertical: there is no trace of a lateral line.

Each of the jaws is armed with a band of villiform *teeth*, the posterior of which are more cardiform: no canines. The vomerine band is narrow, angularly bent; palatine bones smooth. The pharyngeal bones are separated from each other and toothed, as in the typical *Percidæ*.

The *intestines* are badly preserved; pieces of an air-bladder, however, could be easily detected.

	inches.	lines.
Total length (without caudal)	5	3
Height of the body	1	1
Thickness of the body	0	10
Length of the head	1	10
Width between the orbits	0	5
Diameter of the eye..................	0	3
Length of the second dorsal spine	0	11
——— of the last dorsal ray	1	2
——— of the sixth anal ray	1	0
——— of the pectoral	1	2
——— of the ventral	1	2½

Page 286. Add to the doubtful species of **PRISTIPOMA**:—

8. Pristipoma scapulare, *Tschudi, Faun. Peruan. Ichthyol.* p. 12.—Coast of Peru.—It does not appear to be a species of this genus.

Page 305. Add to the doubtful species of **HÆMULON**:—

3. Hæmulon modestum, *Tschudi, Faun. Peruan. Ichthyol.* p. 11.—Coast of Peru.—It does not appear to be a species of this genus.

Page 339.

7. Gerres waigiensis, *Quoy & Gaim.*, is identical with Gerres argyreus, p. 353.

Page 355. **Scolopsis margaritifer.**

Syn.: Scolopsis margaritifer, *Less. Voy. Duperr. Zool. Poiss.* p. 198.

Page 360. **Scolopsis temporalis.**

Syn.: Scolopsis temporalis, *Less. Voy. Duperr. Zool. Poiss.* p. 197. pl. 26.

Page 381. **Pentapus aurolineatus.**

Syn.: Dentex lycogenis, *Benn. Proc. Comm. Zool. Soc.* i. p. 127.

Page 437. Add to the doubtful species of **SARGUS**:—

2. Sargus arenosus, *Dekay, New York Fauna, Fishes*, p. 91. pl. 22. f. 67.—Coast of New York.

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